

**TOXICOLOGICAL EVALUATION  
OF FRESHWATER SEDIMENT SAMPLES**

**FC 1640 LVR Toxicity Test**

10 Day *Chironomus dilutus*  
Survival and Growth Sediment Toxicity Test

Prepared For:

Geosyntec Consultants  
134 North LaSalle, Suite 300  
Chicago, Illinois 60602

Prepared By:

EnviroSystems, Incorporated  
1 Lafayette Road  
Hampton, New Hampshire 03842

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## TOXICOLOGICAL EVALUATION OF FRESHWATER SEDIMENT SAMPLES

FC 1640 LVR Toxicity Test

10 Day *Chironomus dilutus*  
Survival and Growth Sediment Toxicity Test

### **1.0 INTRODUCTION**

This report presents the results of chronic exposure toxicity tests conducted on sediment samples collected for the FC 1640 LVR Toxicity Test. Samples were provided by Geosyntec Consultants, Chicago, Illinois. Testing was based on programs and protocols developed by the ASTM (2010) and US EPA (2000). The toxicity of the samples was assessed by conducting short term survival and growth tests using the freshwater midge, *Chironomus dilutus*. Toxicity tests and supporting analyses were performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire.

Toxicity tests expose groups of organisms to environmental samples, a laboratory control and field reference sites for a specified period to assess potential impacts on a variety of endpoints, such as survival, growth or reproduction. Analysis of variance techniques are used to determine the relative toxicity of the samples as compared to the laboratory control and/or field reference sites.

### **2.0 MATERIALS AND METHODS**

#### **2.1 General Methods, Biological Evaluations**

Toxicological and analytical protocols used in this program follow procedures outlined in *Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates* (ASTM Method E 1706-05, 2010), *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates* (US EPA 2000) and *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition (APHA 1998). These protocols provide standard approaches for physical and chemical analysis and for the evaluation of toxicological effects of sediments on aquatic invertebrates.

#### **2.2 Test Species**

The acute exposure assay was completed using *C. dilutus* obtained from Aquatic BioSystems, Inc., Fort Collins, Colorado. Midge larvae were between 8 and 10 days old and more than 50% were at the third instar stage.

#### **2.3 Test Samples and Laboratory Control Sediment**

Sediment samples collected for the FC 1640 LVR project were received at ESI under chain of custody. Once received, samples were inspected to determine integrity, given unique sample numbers and logged into the laboratory sample management database. Once logged in the samples were placed in a secure refrigerated, 2 - 4 °C, storage area. A listing of sample sites, sample collection, and receipt information is summarized in Table 1.

The control substrate was an artificial sediment prepared according to guidance presented in the EPA/ASTM method. Organic detritus from chironomid cultures and disintegrated paper pulp were used to provide organic content. Overlying water for the sediment toxicity tests was natural surface water, collected from the upper portion of the Taylor River watershed in Hampton Falls, New Hampshire. Use of natural surface water is recommended by the protocol (EPA 2000, ASTM 2010).

## 2.4 *Chironomus dilutus* Survival and Growth Toxicity Tests

Sediment was homogenized and then placed in test chambers. Overlying water was added immediately and then the chambers were allowed to stabilize. The chambers received two volume additions twice a day until organisms were added.

Test vessels were 400 mL glass beakers containing 100 mL of sediment and approximately 225 mL of overlying water. Test vessels were drilled at a consistent height above their bases and the hole covered with Nytex® screen. The screened hole facilitates water exchange while retaining test organisms. Vessels were maintained in a water bath during the test. Depth of the water in the bath was set below the drain hole in the test vessel to eliminate flow of water from the bath into the test vessel. Test chambers were randomly placed in the water bath after addition of test sediments. Placement locations were generated by the CETIS® software program. The block randomized position assignments are found on the Component Test Data Worksheet included in the data appendix. The water bath was maintained in a limited access, temperature controlled room. Temperatures in the room and water bath were independently set at a temperature of 23°C. Temperature was recorded on an hourly frequency using a temperature logger placed in a surrogate vessel. The photoperiod in the test chamber was set at 16:8 hour light:dark. Lighting was supplied by cool white fluorescent bulbs. All test chambers were aerated throughout the assay and dissolved oxygen levels were maintained at 60% saturation or greater.

On day 0, larvae were randomly selected from the pool of organisms and added to test vessels. Each treatment group included 8 replicates with 10 organisms per replicate and a surrogate test chamber that was used to obtain water qualities during the assay without disturbing the test animals. The surrogate chamber was treated the same as actual test chambers with the addition of animals and food, but was not used to determine endpoint data.

Prior to the daily overlying water renewal, dissolved oxygen, pH, specific conductance and temperature were measured in the surrogate chamber for each treatment. Overlying water in each replicate was then renewed. The volume of water added to each test chamber was approximately two volume additions. Test chambers were also renewed again in the afternoon with another two volume additions. Water exchanges were facilitated by use of a distribution system designed to provide equal, regulated flow to each chamber. The system was activated manually by the addition of water during the assay. After the afternoon overlying water renewal each replicate was fed 1.0 mL of 6 g/L Tetramin® flake fish food suspension. Alkalinity, ammonia, and hardness of the overlying water were measured on days 0 and 10. Overlying water quality records are available in Appendix A.

After 10 days exposure, all replicates of each test treatment were terminated to collect data for survival and growth. Each test chamber was gently swirled to loosen the sediments and the test material was dumped on to an appropriately sized mesh screen. The sediments were washed through the sieve using freshwater and material left on the screen was sorted to recover the organisms. This process was continued until the entire sample was evaluated. Surviving larvae were placed on tared weighing pans; partially and fully emerged organisms were recorded in survival counts but not included in weight measurements. Pans were dried overnight at 104°C to obtain dry weight to the nearest 0.01 mg. The organisms were then fired in a muffle furnace for two hours at 550°C to obtain the ash free dry weight to the nearest 0.01 mg. The mean ash free dry weight of surviving organisms was determined to assess growth.

## 2.5 Statistical Analysis

Survival and growth data were analyzed using CETIS® software to determine significant differences between the test sediments and the reference site samples. Data sets were evaluated to determine normality of distribution and homogeneity of sample variance. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were made using the appropriate statistical evaluation. Each Reach was treated as a sample, so that Reach 1 through 3 was individually compared against Reach 4 data. Statistical difference was evaluated at  $\alpha=0.05$ .

## 2.6 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Results are summarized in Table 2.

**Table 1. Summary of Sample Collection and Receipt Information. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Field ID	Sample Designation	ESI Code	Sample Number	Sample Collected		Sample Received	
				Date	Time	Date	Time
OUI-SE-LVR609-110822	Reach 3	21319-001	001	08/22/11	1715	08/24/11	950
OUI-SE-LVR607-110822	Reach 3	21319-002	002	08/22/11	1649	08/24/11	950
OUI-SE-LVR608-110823	Reach 3	21319-003	003	08/23/11	900	08/24/11	950
OUI-SE-LVR604-110824	Reach 2	21319-004	004	08/24/11	1115	08/25/11	1115
OUI-SE-LVR605-110824	Reach 2	21319-005	005	08/24/11	1000	08/25/11	1115
OUI-SE-LVR606-110824	Reach 2	21319-006	006	08/24/11	1030	08/25/11	1115
OUI-SE-LVR610-110823	Reach 4	21319-007	007	08/23/11	1650	08/25/11	1115
OUI-SE-LVR611-110823	Reach 4	21319-008	008	08/23/11	1715	08/25/11	1115
OUI-SE-LVR612-110823	Reach 4	21319-009	009	08/23/11	1540	08/25/11	1115
OUI-SE-LVR602-110825	Reach 1	21319-010	010	08/25/11	900	08/26/11	930
OUI-SE-LVR603-110825	Reach 1	21319-011	011	08/25/11	820	08/26/11	930

**Table 2. Reference Toxicant Evaluation. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Date	Endpoint	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
<i>Chironomus dilutus</i>					
09/19/11	Survival	LC-50	1.52	4.07	0.0 - 9.19 Cadmium (mg/L)

## 3.0 RESULTS AND DISCUSSION

### 3.1 Laboratory Control and Project Reference Site Performance

At the end of the 10 day exposure period, mean survival in laboratory control sediment was 87.50% with a coefficient of variation (CV) of 13.31%. Larvae recovered from laboratory control sediment had a mean dry weight of 3.175 mg/larvae, with a CV of 18.13%. The dry weight of a representative group of larvae at the start of the assay was 0.063 mg/larvae. The minimum acceptable criteria for the laboratory control treatment is  $\geq 70\%$  survival and a mean ash free dry weight (AFDW) of  $\geq 0.48$  mg/larvae. As the laboratory control treatment exceeded the minimum acceptability criteria for the assay the test organisms were determined to be healthy and unstressed and the overlying water was determined to have had no significant adverse impact on the outcome of the assay. These data are considered as valid for evaluating impacts associated with the sediment samples.

Temperature data collected during the daily water quality observations documented a mean value of  $22.92^{\circ}\text{C}$  with a range of  $20.30$  to  $24.55^{\circ}\text{C}$ . Confirmation temperature data collected in a surrogate replicate daily documented a mean temperature of  $23.5^{\circ}\text{C}$  with a range of  $20.3$  to  $25.2^{\circ}\text{C}$ . In accordance with ASTM Method 1706-05, test acceptability criteria requires a mean temperature of  $23 \pm 1^{\circ}\text{C}$ , with maximum temporary fluctuations of  $23 \pm 3^{\circ}\text{C}$ . Water quality data are summarized in Table 6 and provided in detail in Appendix A.

**Table 3. Summary of Acceptable Endpoints and Measurements. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Endpoint / Measurement Protocol Criteria

Survival	lab mean $\geq$ 70%	Mean Survival %	87.50
		Protocol Met	Yes
Mean Ash Free Dry Wt.	lab $> 0.48$ mg/larvae	(mg)	3.175
	Protocol Met	Protocol Met	Yes
Temperature	mean: $23^{\circ}\pm 1^{\circ}\text{C}$ minimum: $20^{\circ}\text{C}$ maximum: $26^{\circ}\text{C}$	daily / hourly daily / hourly daily / hourly Protocol Met	22.92 / 23.5 20.30 / 20.3 24.55 / 25.2 Yes / Yes

**Table 4. Summary of Project Reference Site Performance. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Field ID	ESI Code	Sample Number	Survival (%)		Growth - Weight (mg)		Growth - Biomass (mg)	
			Mean	CV	Mean	CV	Mean	CV
OUI-SE-LVR610-110823	21319-007	007	97.50%	4.75%	1.510	36.92%	1.453	31.75%
OUI-SE-LVR611-110823	21319-008	008	95.00%	7.96%	1.630	45.99%	1.531	43.21%
OUI-SE-LVR612-110823	21319-009	009	93.75%	11.31%	1.615	36.86%	1.507	38.44%

### 3.2 Protocol Deviations

Review of data generated during the 10-day exposure period documented one minor deviation. There were 3 test chambers that had more than 10 animals loaded at the start of the assay. It is the opinion of ESI's study director that this deviation did not adversely affect the outcome of the assay.

### 3.3 Summary

This program utilized protocols developed by the US EPA and ASTM to assess the potential toxicological impacts that exposure to FC 1640 LVR sediments would have on invertebrates. Table 5 provides a summary of demonstrated effects, based on comparisons between the laboratory control and the reference site sample. Tables 6 through 8 provide summaries of assay endpoints and detailed statistical results for each sample location. Table 9 summarizes overlying water qualities measured during the test. Laboratory bench sheets, water quality data, detailed summaries of survival, dry weights and associated statistical support data are included in Appendix A.

**Table 5. Summary of Significant Endpoints. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Field ID	ESI Code	Sample Number	survival	dry wt	dry biomass
OUI-SE-LVR609-110822	21319-001	001			
OUI-SE-LVR607-110822	21319-002	002	Reach 3	Yes	No
OUI-SE-LVR608-110823	21319-003	003			
OUI-SE-LVR604-110824	21319-004	004			
OUI-SE-LVR605-110824	21319-005	005	Reach 2	Yes / No*	No
OUI-SE-LVR606-110824	21319-006	006			Yes
OUI-SE-LVR602-110825	21319-010	010			
OUI-SE-LVR603-110825	21319-011	011	Reach 1	No	Yes

\*\* Indicates that the analysis was conducted with the exclusion of an outlier.

#### **4.0 REFERENCES**

- APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition. Washington D.C.
- ASTM. 2010. Annual Book of ASTM Standards. Volume 11.06. *Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates*. E 1706-05. ASTM, Philadelphia.
- US EPA. 2000. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates*. Second Edition. EPA/600-R-99/064. Method 100.5.

**Table 6. Survival Summary and Statistical Analysis. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Day 10 Survival Summary - Component Summary							
Field ID	ESI Code	Sample Number	Reps Analyzed	Mean	Minimum	Maximum	CV
Laboratory Control	21319-000	000	8	87.50%	70%	100%	13.31%
OUI-SE-LVR610-110823	21319-007	007	Reach 4	8	97.50%	90%	100%
OUI-SE-LVR611-110823	21319-008	008	Reach 4	8	95.00%	80%	100%
OUI-SE-LVR612-110823	21319-009	009	Reach 4	8	93.75%	70%	100%
OUI-SE-LVR609-110822	21319-001	001	Reach 3	8	96.25%	90%	100%
OUI-SE-LVR607-110822	21319-002	002	Reach 3	8	31.25%	0%	80%
OUI-SE-LVR608-110823	21319-003	003	Reach 3	8	91.25%	80%	100%
OUI-SE-LVR604-110824	21319-004	004	Reach 2	8	57.50%	0%	100%
OUI-SE-LVR605-110824	21319-005	005	Reach 2	8	92.50%	70%	100%
OUI-SE-LVR606-110824	21319-006	006	Reach 2	8	86.25%	20%	100%
OUI-SE-LVR602-110825	21319-010	010	Reach 1	8	72.50%	0%	100%
OUI-SE-LVR603-110825	21319-011	011	Reach 1	8	75.00%	0%	100%

Day 10 Survival Summary - Reach Summary							
Field ID	ESI Code	Sample Number	Mean	Minimum	Maximum	CV	Reject Null
OUI-SE-LVR610-110823	21319-007	007					
OUI-SE-LVR611-110823	21319-008	008	Reach 4	95.42%	70%	100%	8.16%
OUI-SE-LVR612-110823	21319-009	009					
OUI-SE-LVR609-110822	21319-001	001					
OUI-SE-LVR607-110822	21319-002	002	Reach 3	72.92%	0%	100%	49.77%
OUI-SE-LVR608-110823	21319-003	003					
OUI-SE-LVR604-110824	21319-004	004					
OUI-SE-LVR605-110824	21319-005	005	Reach 2	78.75%	0%	100%	42.58% Yes / No*
OUI-SE-LVR606-110824	21319-006	006					
OUI-SE-LVR602-110825	21319-010	010	Reach 1	73.75%	0%	100%	54.66%
OUI-SE-LVR603-110825	21319-011	011					No

“\*” Indicates that the analysis was conducted with the exclusion of an outlier.

**Table 7. Ash Free Dry Weight Summary and Statistical Analysis. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Ash Free Dry Weight Summary - Component Summary								
Field ID	ESI Code	Sample Number	Reps Analyzed	Mean	Minimum	Maximum	CV	
Laboratory Control	21319-000	000	8	3.175	2.335	3.960	18.13%	
OUI-SE-LVR610-110823	21319-007	007	Reach 4	8	1.510	0.845	2.662	36.92%
OUI-SE-LVR611-110823	21319-008	008	Reach 4	8	1.630	0.857	2.826	45.99%
OUI-SE-LVR612-110823	21319-009	009	Reach 4	8	1.615	1.000	2.507	36.86%
OUI-SE-LVR609-110822	21319-001	001	Reach 3	8	1.773	1.246	2.480	24.14%
OUI-SE-LVR607-110822	21319-002	002	Reach 3	4	0.598	0.345	0.851	36.60%
OUI-SE-LVR608-110823	21319-003	003	Reach 3	8	1.750	0.953	2.514	30.25%
OUI-SE-LVR604-110824	21319-004	004	Reach 2	7	0.917	0.030	1.565	70.59%
OUI-SE-LVR605-110824	21319-005	005	Reach 2	8	1.364	0.984	1.761	22.07%
OUI-SE-LVR606-110824	21319-006	006	Reach 2	8	1.608	0.998	2.062	24.94%
OUI-SE-LVR602-110825	21319-010	010	Reach 1	7	1.082	0.380	1.747	38.16%
OUI-SE-LVR603-110825	21319-011	011	Reach 1	7	1.105	0.420	1.947	50.52%

Ash Free Dry Weight Summary - Reach Summary								
Field ID	ESI Code	Sample Number	Mean	Minimum	Maximum	CV	Reject Null	
OUI-SE-LVR610-110823	21319-007	007						
OUI-SE-LVR611-110823	21319-008	008	Reach 4	1.585	0.845	2.826	38.71%	-
OUI-SE-LVR612-110823	21319-009	009						
OUI-SE-LVR609-110822	21319-001	001						
OUI-SE-LVR607-110822	21319-002	002	Reach 3	1.529	0.345	2.514	41.70%	No
OUI-SE-LVR608-110823	21319-003	003						
OUI-SE-LVR604-110824	21319-004	004						
OUI-SE-LVR605-110824	21319-005	005	Reach 2	1.313	0.030	2.062	40.08%	No
OUI-SE-LVR606-110824	21319-006	006						
OUI-SE-LVR602-110825	21319-010	010						
OUI-SE-LVR603-110825	21319-011	011	Reach 1	1.094	0.380	1.947	43.15%	Yes

**Table 8. Ash Free Dry Biomass Summary and Statistical Analysis. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Ash Free Dry Biomass Summary - Component Summary							
Field ID	ESI Code	Sample Number	Reps Analyzed	Mean	Minimum	Maximum	CV
Laboratory Control	21319-000	000	8	2.246	1.164	3.564	33.89%
OUI-SE-LVR610-110823	21319-007	007	Reach 4	8	1.453	0.845	2.396
OUI-SE-LVR611-110823	21319-008	008	Reach 4	8	1.531	0.857	2.577
OUI-SE-LVR612-110823	21319-009	009	Reach 4	8	1.507	1.000	2.507
OUI-SE-LVR609-110822	21319-001	001	Reach 3	8	1.672	1.246	2.354
OUI-SE-LVR607-110822	21319-002	002	Reach 3	4	0.389	0.204	0.596
OUI-SE-LVR608-110823	21319-003	003	Reach 3	8	1.620	0.762	2.514
OUI-SE-LVR604-110824	21319-004	004	Reach 2	7	0.830	0.003	1.565
OUI-SE-LVR605-110824	21319-005	005	Reach 2	8	1.265	0.886	1.761
OUI-SE-LVR606-110824	21319-006	006	Reach 2	8	1.391	0.326	2.062
OUI-SE-LVR602-110825	21319-010	010	Reach 1	7	0.984	0.038	1.747
OUI-SE-LVR603-110825	21319-011	011	Reach 1	7	1.039	0.084	1.947

Ash Free Dry Biomass Summary - Reach Summary							
Field ID	ESI Code	Sample Number	Mean	Minimum	Maximum	CV	Reject Null
OUI-SE-LVR610-110823	21319-007	007					
OUI-SE-LVR611-110823	21319-008	008	Reach 4	1.497	0.845	2.577	36.66%
OUI-SE-LVR612-110823	21319-009	009					-
OUI-SE-LVR609-110822	21319-001	001					
OUI-SE-LVR607-110822	21319-002	002	Reach 3	1.395	0.204	2.514	47.78%
OUI-SE-LVR608-110823	21319-003	003					
OUI-SE-LVR604-110824	21319-004	004					
OUI-SE-LVR605-110824	21319-005	005	Reach 2	1.176	0.003	2.062	49.53%
OUI-SE-LVR606-110824	21319-006	006					No
OUI-SE-LVR602-110825	21319-010	010					
OUI-SE-LVR603-110825	21319-011	011	Reach 1	1.011	0.038	1.947	55.69%
							Yes

**Table 9. Summary of Water Qualities. FC 1640 LVR Toxicity Test. *Chironomus dilutus* Sediment Assay. September 2011.**

Field ID	ESI Code	Sample Number	Day	Date Sampled	Conductivity (uS/cm)	Alkalinity (mg/L)	Hardness (mg/L)	Ammonia (mg/L)
Laboratory Control	21319-000	000	0	09/16/11	215	55	57	<0.1
OUI-SE-LVR609-110822	21319-001	001	0	09/16/11	257	71	73	<0.1
OUI-SE-LVR607-110822	21319-002	002	0	09/16/11	218	51	55	<0.1
OUI-SE-LVR608-110823	21319-003	003	0	09/16/11	211	48	49	<0.1
OUI-SE-LVR604-110824	21319-004	004	0	09/16/11	207	47	54	<0.1
OUI-SE-LVR605-110824	21319-005	005	0	09/16/11	208	48	58	<0.1
OUI-SE-LVR606-110824	21319-006	006	0	09/16/11	206	47	57	<0.1
OUI-SE-LVR610-110823	21319-007	007	0	09/16/11	208	47	53	<0.1
OUI-SE-LVR611-110823	21319-008	008	0	09/16/11	231	63	62	<0.1
OUI-SE-LVR612-110823	21319-009	009	0	09/16/11	208	47	55	<0.1
OUI-SE-LVR602-110825	21319-010	010	0	09/16/11	208	48	52	<0.1
OUI-SE-LVR603-110825	21319-011	011	0	09/16/11	203	46	51	<0.1
Laboratory Control	21319-000	000	10	09/26/11	227	51	53	<0.1
OUI-SE-LVR609-110822	21319-001	001	10	09/26/11	276	80	76	<0.1
OUI-SE-LVR607-110822	21319-002	002	10	09/26/11	254	69	68	<0.1
OUI-SE-LVR608-110823	21319-003	003	10	09/26/11	241	57	62	<0.1
OUI-SE-LVR604-110824	21319-004	004	10	09/26/11	237	60	64	<0.1
OUI-SE-LVR605-110824	21319-005	005	10	09/26/11	239	59	62	<0.1
OUI-SE-LVR606-110824	21319-006	006	10	09/26/11	238	59	62	<0.1
OUI-SE-LVR610-110823	21319-007	007	10	09/26/11	238	61	60	<0.1
OUI-SE-LVR611-110823	21319-008	008	10	09/26/11	269	76	69	<0.1
OUI-SE-LVR612-110823	21319-009	009	10	09/26/11	243	61	62	<0.1
OUI-SE-LVR602-110825	21319-010	010	10	09/26/11	235	59	56	<0.1
OUI-SE-LVR603-110825	21319-011	011	10	09/26/11	240	58	59	<0.1

### Comments

Additional water quality data are provided in Appendix A.

## APPENDIX A: RAW DATA AND STATISTICAL SUPPORT

Contents	Number of Pages
C. <i>dilutus</i> 10-Day Sediment Toxicity Test	
Day 0 - 10 Daily Observation Record	1
CETIS Component Test Data Worksheet	2
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***Chironomus dilutus***  
**10 Day SEDIMENT ASSAY**

Study: 21321		Client: Geosyntec Consultants		Project: FC 1640 LVR Toxicity Test
Day	Date	am Water Qualities & Renew	pm Renew & Feed	Notes
		Initial	Initial	
0	09/16/11	✓/✓ JTP	✓/✓ JTP	
1	9/17/11	✓/✓ SJ/BS	✓/✓ SJ/CS	
2	9/18/11	✓/✓ SJ	✓/✓ SJ/CS	
3	09/19/11	✓/✓ JTP	✓/✓ JTP	
4	09/20/11	✓/✓ JTP	✓/✓ JTP	
5	09/21/11	✓/✓ JTP	✓/✓ JTP/RAM	
6	09/22/11	✓/✓ DM	✓/✓ JTP	
7	09/23/11	✓/✓ JTP/RAM	✓/✓ JTP	
8	9/24	✓/✓ DM/CS	✓/✓ DM/CS	
9	09/25/11	✓/✓ JTP	✓/✓ DM	
10	09/26/11	RAM	-	

Alkalinity, Hardness & Ammonia collected		Day 0	Initial: RAM
		Day 10	Initial: RAM/BS
Notes: 23 °C	Feed 1 mL of 6 g/L Tetramin Flake Daily	Aerate if DO is below 2.5 mg/L	Two Volume Additions Twice a Day

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**Component Test Data Worksheet**

The position number on these pages were used during assay conduct.

**CETIS Test Data Worksheet**

Report Date:

20 Dec-11 13:00 (p 1 of 2)

Test Code:

09-4653-9154/21321Cd

**Chironomus 10-d Survival and Growth Sediment Test****EnviroSystems, Inc.**

**Start Date:** 16 Sep-11 12:00    **Species:** Chironomus dilutus  
**End Date:** 26 Sep-11 12:00    **Protocol:** EPA/600/R-99/064 (2000)  
**Sample Date:** 31 Aug-11 12:00    **Material:** Freshwater Sediment

**Sample Code:** 21319-000**Sample Source:** FC1640 LVR Toxicity Test**Sample Station:** Laboratory Control

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Ashed Weight-mg	Pan Count	Mean Length-mm	TareWt
21319-007	1	1	10	9	238.4	214.44	9		
21319-003	1	2	10	9	236.43	214.51	9		
21319-008	1	3	10	8	236.67	214.06	8		
21319-010	1	4	10	0			0		
21319-002	1	5	10	0			0		
21319-011	1	6	10	10	237.02	217.55	10		
21319-001	1	7	10	9	234.69	214.85	8		
21319-005	1	8	10	7	223.69	213.07	7		
21319-009	1	9	10	9	237.47	216.34	9		
21319-006	1	10	10	10	235.31	215.2	10		
21319-000	1	11	10	8	239.38	212.9	7		
21319-004	1	12	10	0			0		
21319-011	2	13	10	10	226.62	213.55	10		
21319-008	2	14	10	10	242.13	216.36	10		
21319-009	2	15	10	10	240	214.93	10		
21319-003	2	16	10	10	241.32	216.18	10		
21319-007	2	17	10	10	229.19	214.22	10		
21319-004	2	18	10	9	226.03	213.44	9		
21319-002	2	19	10	0			0		
21319-005	2	20	11	11	236.83	217.46	11		
21319-010	2	21	10	10	234.23	216.76	10		
21319-006	2	22	10	10	237.05	216.43	10		
21319-001	2	23	10	10	239.82	216.28	10		
21319-000	2	24	10	9	249.05	213.41	9		
21319-000	3	25	10	7	232.27	212.93	6		
21319-001	3	26	10	10	232.05	215.52	10		
21319-009	3	27	10	10	231.81	215.59	10		
21319-006	3	28	10	9	230.13	214.21	9		
21319-002	3	29	10	0			0		
21319-011	3	30	10	0			0		
21319-003	3	31	10	10	231.86	215.9	10		
21319-004	3	32	10	10	228.4	213.52	10		
21319-005	3	33	10	9	226.74	213.83	9		
21319-008	3	34	10	9	226.92	215.28	9		
21319-007	3	35	10	10	226.94	213.3	10		
21319-010	3	36	10	10	222.7	214.21	10		
21319-001	4	37	10	10	232.07	216.58	10		
21319-004	4	38	10	1	211.21	211.18	1		
21319-000	4	39	10	10	222.98	211.34	4		
21319-005	4	40	10	10	227.83	213.81	10		
21319-010	4	41	10	10	228.36	216.07	10		
21319-011	4	42	10	8	218.34	213.23	8		
21319-003	4	43	10	9	227.54	214.87	9		
21319-009	4	44	10	7	223.75	213.45	7		
21319-007	4	45	10	10	227.76	214.28	10		
21319-002	4	46	10	0			0		
21319-008	4	47	10	10	236.21	216.65	10		

**Component Test Data Worksheet****The position number on these pages were used during assay conduct.****CETIS Test Data Worksheet****Report Date:**

20 Dec-11 13:00 (p 2 of 2)

**Test Code:**

09-4653-9154/21321Cd

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Ashed Weight-mg	Pan Count	Mean Length-mm	TareWt
21319-006	4	48	10	10	230.6	212.74	10		
21319-001	5	49	10	10	235.54	217.83	10		
21319-004	5	50	10	10	228.8	213.15	10		
21319-002	5	51	10	7	219.4	213.44	7		
21319-005	5	52	10	10	232.88	215.92	10		
21319-011	5	53	10	10	231.57	214.83	10		
21319-006	5	54	10	9	227.16	213.01	9		
21319-010	5	55	10	9	225.54	215.56	9		
21319-008	5	56	11	11	232.41	215.75	11		
21319-003	5	57	10	10	234.41	214.54	10		
21319-007	5	58	10	9	231.38	214.16	9		
21319-009	5	59	10	9	233.41	216.34	9		
21319-000	5	60	10	8	236.79	212.94	7		
21319-003	6	61	10	8	227.22	214.78	8		
21319-010	6	62	10	1	211.56	211.18	1		
21319-007	6	63	10	10	226.96	213.38	10		
21319-000	6	64	10	8	225.51	211.5	6		
21319-004	6	65	10	1	210.34	210.21	1		
21319-009	6	66	10	10	223.58	213.27	10		
21319-008	6	67	10	10	222.94	214.37	10		
21319-005	6	68	10	9	223.11	214.15	9		
21319-011	6	69	10	10	223.49	215.06	10		
21319-006	6	70	10	10	223.77	213.4	10		
21319-002	6	71	10	4	213.91	211.87	4		
21319-001	6	72	10	9	231.74	216.82	9		
21319-002	7	73	10	6	214.61	212.54	6		
21319-004	7	74	10	5	214.72	211.47	5		
21319-009	7	75	10	10	224.41	213.99	10		
21319-003	7	76	10	9	229.81	215.81	9		
21319-005	7	77	10	10	224.18	212.93	10		
21319-000	7	78	10	10	235.41	213.1	9		
21319-008	7	79	12	12	226.91	214.47	12		
21319-007	7	80	10	10	224.56	213.62	10		
21319-006	7	81	10	2	214.98	211.72	2		
21319-011	7	82	10	10	222.71	213.67	10		
21319-001	7	83	10	9	229.05	215.78	9		
21319-010	7	84	10	10	225.22	214.51	10		
21319-011	8	85	10	2	211.97	211.13	2		
21319-010	8	86	10	8	223.26	213.72	8		
21319-000	8	87	10	10	239.72	213.3	8		
21319-004	8	88	10	10	224.03	212.49	10		
21319-002	8	89	10	8	219.61	214.12	8		
21319-006	8	90	10	9	222.17	213.19	9		
21319-008	8	91	10	9	223.05	214.24	9		
21319-003	8	92	10	8	223.76	216.14	8		
21319-001	8	93	10	10	230.29	217.83	10		
21319-009	8	94	10	10	225.68	215.68	10		
21319-007	8	95	10	10	222.74	214.29	10		
21319-005	8	96	10	9	223.05	214.19	9		

The position number here does not correspond with the position number originally assigned to the test. That can be found on the Component Test Data Worksheet.

## CETIS Test Data Worksheet

Report Date: 20 Dec-11 13:01 (p 1 of 2)  
Test Code: 14-7135-2716/21319Cd

### Chironomus 10-d Survival and Growth Sediment Test

EnviroSystems, Inc.

Start Date: 16 Sep-11 13:00 Species: Chironomus dilutus  
End Date: 26 Sep-11 13:00 Protocol: EPA/600/R-99/064 (2000)  
Sample Date: 13 Sep-11 12:00 Material: Freshwater Sediment

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Ashed Weight-mg	Pan Count	Mean Length-mm	TareWt
21319-000	1	14	10	8	239.38	212.9	7		
21319-000	2	1	10	9	249.05	213.41	9		
21319-000	3	17	10	7	232.27	212.93	6		
21319-000	4	69	10	10	222.98	211.34	4		
21319-000	5	53	10	8	236.79	212.94	7		
21319-000	6	67	10	8	225.51	211.5	6		
21319-000	7	32	10	10	235.41	213.1	9		
21319-000	8	96	10	10	239.72	213.3	8		
21319Reach 4	1	42	10	9	238.4	214.44	9		
21319Reach 4	2	33	10	10	229.19	214.22	10		
21319Reach 4	3	72	10	10	226.94	213.3	10		
21319Reach 4	4	83	10	10	227.76	214.28	10		
21319Reach 4	5	89	10	9	231.38	214.16	9		
21319Reach 4	6	77	10	10	226.96	213.38	10		
21319Reach 4	7	6	10	10	224.56	213.62	10		
21319Reach 4	8	43	10	10	222.74	214.29	10		
21319Reach 4	9	64	10	8	236.67	214.06	8		
21319Reach 4	10	8	10	10	242.13	216.36	10		
21319Reach 4	11	11	10	9	226.92	215.28	9		
21319Reach 4	12	37	10	10	236.21	216.65	10		
21319Reach 4	13	75	11	11	232.41	215.75	11		
21319Reach 4	14	47	10	10	222.94	214.37	10		
21319Reach 4	15	51	12	12	226.91	214.47	12		
21319Reach 4	16	44	10	9	223.05	214.24	9		
21319Reach 4	17	61	10	9	237.47	216.34	9		
21319Reach 4	18	94	10	10	240	214.93	10		
21319Reach 4	19	3	10	10	231.81	215.59	10		
21319Reach 4	20	55	10	7	223.75	213.45	7		
21319Reach 4	21	29	10	9	233.41	216.34	9		
21319Reach 4	22	95	10	10	223.58	213.27	10		
21319Reach 4	23	9	10	10	224.41	213.99	10		
21319Reach 4	24	26	10	10	225.68	215.68	10		
21319Reach 3	1	35	10	9	234.69	214.85	8		
21319Reach 3	2	27	10	10	239.82	216.28	10		
21319Reach 3	3	86	10	10	232.05	215.52	10		
21319Reach 3	4	79	10	10	232.07	216.58	10		
21319Reach 3	5	46	10	10	235.54	217.83	10		
21319Reach 3	6	56	10	9	231.74	216.82	9		
21319Reach 3	7	34	10	9	229.05	215.78	9		
21319Reach 3	8	81	10	10	230.29	217.83	10		
21319Reach 3	9	66	10	0			0		
21319Reach 3	10	49	10	0			0		
21319Reach 3	11	78	10	0			0		
21319Reach 3	12	92	10	0			0		
21319Reach 3	13	31	10	7	219.4	213.44	7		
21319Reach 3	14	21	10	4	213.91	211.87	4		
21319Reach 3	15	71	10	6	214.61	212.54	6		

The position number here does not correspond with the position number originally assigned to the test. That can be found on the Component Test Data Worksheet.

## CETIS Test Data Worksheet

Report Date:

20 Dec-11 13:01 (p 2 of 2)

Test Code:

14-7135-2716/21319Cd

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Ashed Weight-mg	Pan Count	Mean Length-mm	TareWt
21319Reach 3	16	13	10	8	219.61	214.12	8		
21319Reach 3	17	52	10	9	236.43	214.51	9		
21319Reach 3	18	76	10	10	241.32	216.18	10		
21319Reach 3	19	23	10	10	231.86	215.9	10		
21319Reach 3	20	59	10	9	227.54	214.87	9		
21319Reach 3	21	30	10	10	234.41	214.54	10		
21319Reach 3	22	57	10	8	227.22	214.78	8		
21319Reach 3	23	50	10	9	229.81	215.81	9		
21319Reach 3	24	73	10	8	223.76	216.14	8		
21319Reach 2	1	60	10	0			0		
21319Reach 2	2	58	10	9	226.03	213.44	9		
21319Reach 2	3	45	10	10	228.4	213.52	10		
21319Reach 2	4	20	10	1	211.21	211.18	1		
21319Reach 2	5	39	10	10	228.8	213.15	10		
21319Reach 2	6	48	10	1	210.34	210.21	1		
21319Reach 2	7	70	10	5	214.72	211.47	5		
21319Reach 2	8	74	10	10	224.03	212.49	10		
21319Reach 2	9	7	10	7	223.69	213.07	7		
21319Reach 2	10	40	11	11	236.83	217.46	11		
21319Reach 2	11	68	10	9	226.74	213.83	9		
21319Reach 2	12	10	10	10	227.83	213.81	10		
21319Reach 2	13	4	10	10	232.88	215.92	10		
21319Reach 2	14	54	10	9	223.11	214.15	9		
21319Reach 2	15	90	10	10	224.18	212.93	10		
21319Reach 2	16	65	10	9	223.05	214.19	9		
21319Reach 2	17	25	10	10	235.31	215.2	10		
21319Reach 2	18	84	10	10	237.05	216.43	10		
21319Reach 2	19	18	10	9	230.13	214.21	9		
21319Reach 2	20	36	10	10	230.6	212.74	10		
21319Reach 2	21	15	10	9	227.16	213.01	9		
21319Reach 2	22	80	10	10	223.77	213.4	10		
21319Reach 2	23	19	10	2	214.98	211.72	2		
21319Reach 2	24	87	10	9	222.17	213.19	9		
21319Reach 1	1	12	10	0			0		
21319Reach 1	2	38	10	10	234.23	216.76	10		
21319Reach 1	3	16	10	10	222.7	214.21	10		
21319Reach 1	4	63	10	10	228.36	216.07	10		
21319Reach 1	5	24	10	9	225.54	215.56	9		
21319Reach 1	6	2	10	1	211.56	211.18	1		
21319Reach 1	7	91	10	10	225.22	214.51	10		
21319Reach 1	8	88	10	8	223.26	213.72	8		
21319Reach 1	9	62	10	10	237.02	217.55	10		
21319Reach 1	10	93	10	10	226.62	213.55	10		
21319Reach 1	11	22	10	0			0		
21319Reach 1	12	82	10	8	218.34	213.23	8		
21319Reach 1	13	5	10	10	231.57	214.83	10		
21319Reach 1	14	85	10	10	223.49	215.06	10		
21319Reach 1	15	28	10	10	222.71	213.67	10		
21319Reach 1	16	41	10	2	211.97	211.13	2		

YSI 556 MPS Sample Reading Order

Study: 21321

Client: Geosyntec Consultants

Project: FC 1640 LVR Toxicity Test

Reading Number	Field ID	Receipt Number	Sample Number
0	Laboratory Control	21319-000	000
1	OUI-SE-LVR609-110822	21319-001	001
2	OUI-SE-LVR607-110822	21319-002	002
3	OUI-SE-LVR608-110823	21319-003	003
4	OUI-SE-LVR604-110824	21319-004	004
5	OUI-SE-LVR605-110824	21319-005	005
6	OUI-SE-LVR606-110824	21319-006	006
7	OUI-SE-LVR610-110823	21319-007	007
8	OUI-SE-LVR611-110823	21319-008	008
9	OUI-SE-LVR612-110823	21319-009	009
10	OUI-SE-LVR602-110825	21319-010	010
11	OUI-SE-LVR603-110825	21319-011	011

**STUDY: 21321**  
**CLIENT: Geosyntec Consultants**  
**PROJECT: FC 1640 LVR Toxicity Test**  
**ASSAY: Chironomus dilutus Sediment Assay**  
**TASK: Daily Overlying Water Summary**

	Temp	DO Conc	pH	SpCond	Salinity	DO%
Minimum:	20.30	5.69	6.28	164	0.08	68.30
Mean:	22.92	7.80		227	0.11	90.65
Maximum:	24.55	8.64	8.15	278	0.13	97.90

Field ID	Sample Number	Day	Date/Time M/D/Y	Temp C	DO Conc mg/L	pH SU	SpCond uS/cm	Salinity ppt	DO% %
Laboratory Control	000	0	09/16/11 08:48:25	20.45	7.89	7.67	215	0.10	87.6
OUI-SE-LVR609-110822	001	0	09/16/11 08:48:56	20.43	7.93	7.95	257	0.12	88.0
OUI-SE-LVR607-110822	002	0	09/16/11 08:49:19	20.43	8.24	8.02	218	0.10	91.5
OUI-SE-LVR608-110823	003	0	09/16/11 08:49:43	20.41	8.37	7.97	211	0.10	92.9
OUI-SE-LVR604-110824	004	0	09/16/11 08:50:06	20.42	8.35	7.94	207	0.10	92.7
OUI-SE-LVR605-110824	005	0	09/16/11 08:50:28	20.43	8.36	7.93	208	0.10	92.8
OUI-SE-LVR606-110824	006	0	09/16/11 08:50:50	20.41	8.36	7.93	206	0.10	92.7
OUI-SE-LVR610-110823	007	0	09/16/11 08:51:14	20.35	8.38	7.92	208	0.10	92.9
OUI-SE-LVR611-110823	008	0	09/16/11 08:51:38	20.30	8.32	8.08	231	0.11	92.1
OUI-SE-LVR612-110823	009	0	09/16/11 08:52:02	20.33	8.32	8.03	208	0.10	92.2
OUI-SE-LVR602-110825	010	0	09/16/11 08:52:24	20.35	8.41	7.97	208	0.10	93.2
OUI-SE-LVR603-110825	011	0	09/16/11 08:52:45	20.30	8.37	7.93	203	0.10	92.7
Laboratory Control	000	1	09/17/11 07:49:07	21.40	7.85	7.26	194	0.09	88.8
OUI-SE-LVR609-110822	001	1	09/17/11 07:50:00	21.48	8.35	7.93	226	0.11	94.6
OUI-SE-LVR607-110822	002	1	09/17/11 07:50:12	21.47	8.37	7.98	199	0.09	94.8
OUI-SE-LVR608-110823	003	1	09/17/11 07:50:26	21.48	8.48	7.92	190	0.09	96.1
OUI-SE-LVR604-110824	004	1	09/17/11 07:50:38	21.51	8.56	7.89	187	0.09	97.0
OUI-SE-LVR605-110824	005	1	09/17/11 07:50:54	21.52	8.63	7.83	188	0.09	97.8
OUI-SE-LVR606-110824	006	1	09/17/11 07:51:05	21.51	8.64	7.84	186	0.09	97.9
OUI-SE-LVR610-110823	007	1	09/17/11 07:51:18	21.52	8.64	7.83	188	0.09	97.9
OUI-SE-LVR611-110823	008	1	09/17/11 07:51:35	21.48	8.55	7.89	208	0.10	96.8
OUI-SE-LVR612-110823	009	1	09/17/11 07:51:47	21.48	8.39	7.95	194	0.09	95.0
OUI-SE-LVR602-110825	010	1	09/17/11 07:52:01	21.48	8.62	7.91	188	0.09	97.7
OUI-SE-LVR603-110825	011	1	09/17/11 07:52:22	21.40	8.54	7.77	185	0.09	96.6
Laboratory Control	000	2	09/18/11 07:54:20	21.83	6.58	6.28	175	0.08	na
OUI-SE-LVR609-110822	001	2	09/18/11 07:55:35	21.80	7.89	7.97	210	0.10	na
OUI-SE-LVR607-110822	002	2	09/18/11 07:55:49	21.80	7.97	8.04	185	0.09	na
OUI-SE-LVR608-110823	003	2	09/18/11 07:56:01	21.79	8.06	8.02	185	0.09	na
OUI-SE-LVR604-110824	004	2	09/18/11 07:56:15	21.81	8.18	7.99	181	0.09	na
OUI-SE-LVR605-110824	005	2	09/18/11 07:56:27	21.83	8.18	7.93	176	0.08	na
OUI-SE-LVR606-110824	006	2	09/18/11 07:56:42	21.84	8.22	7.92	164	0.08	na
OUI-SE-LVR610-110823	007	2	09/18/11 07:56:56	21.84	8.28	7.94	174	0.08	na
OUI-SE-LVR611-110823	008	2	09/18/11 07:57:08	21.83	8.24	7.95	198	0.09	na
OUI-SE-LVR612-110823	009	2	09/18/11 07:57:23	21.81	8.10	8.07	176	0.08	na
OUI-SE-LVR602-110825	010	2	09/18/11 07:57:34	21.80	8.19	8.03	177	0.08	na
OUI-SE-LVR603-110825	011	2	09/18/11 07:57:45	21.77	8.24	7.98	173	0.08	na
Laboratory Control	000	3	09/19/11 08:05:56	21.02	7.74	7.49	210	0.10	86.9
OUI-SE-LVR609-110822	001	3	09/19/11 08:06:47	21.03	8.41	8.03	267	0.13	94.4
OUI-SE-LVR607-110822	002	3	09/19/11 08:07:05	21.04	8.54	8.04	219	0.10	95.9
OUI-SE-LVR608-110823	003	3	09/19/11 08:07:26	21.04	8.62	7.99	218	0.10	96.8

Field ID	Sample Number	Day	Date/Time M/D/Y	Temp C	DO Conc mg/L	pH SU	SpCond uS/cm	Salinity ppt	DO% %
OUI-SE-LVR604-110824	004	3	09/19/11 08:07:46	21.05	8.62	7.95	209	0.10	96.9
OUI-SE-LVR605-110824	005	3	09/19/11 08:08:06	21.05	8.60	7.92	204	0.10	96.6
OUI-SE-LVR606-110824	006	3	09/19/11 08:08:26	21.06	8.59	7.95	216	0.10	96.5
OUI-SE-LVR610-110823	007	3	09/19/11 08:08:43	21.04	8.60	7.95	217	0.10	96.5
OUI-SE-LVR611-110823	008	3	09/19/11 08:09:03	21.05	8.52	8.08	250	0.12	95.7
OUI-SE-LVR612-110823	009	3	09/19/11 08:09:19	21.03	8.50	8.10	225	0.11	95.5
OUI-SE-LVR602-110825	010	3	09/19/11 08:09:37	20.97	8.60	8.04	199	0.09	96.4
OUI-SE-LVR603-110825	011	3	09/19/11 08:09:59	20.87	8.54	7.95	223	0.11	95.6
Laboratory Control	000	4	09/20/11 08:26:49	22.53	7.10	7.50	215	0.10	82.1
OUI-SE-LVR609-110822	001	4	09/20/11 08:27:36	22.51	7.77	8.05	270	0.13	89.8
OUI-SE-LVR607-110822	002	4	09/20/11 08:27:50	22.49	7.84	8.05	247	0.12	90.6
OUI-SE-LVR608-110823	003	4	09/20/11 08:28:17	22.50	8.09	8.02	229	0.11	93.4
OUI-SE-LVR604-110824	004	4	09/20/11 08:28:47	22.52	8.10	7.94	225	0.11	93.6
OUI-SE-LVR605-110824	005	4	09/20/11 08:29:03	22.49	8.16	7.96	231	0.11	94.3
OUI-SE-LVR606-110824	006	4	09/20/11 08:29:27	22.55	8.12	7.99	225	0.11	93.8
OUI-SE-LVR610-110823	007	4	09/20/11 08:29:56	22.53	8.15	7.98	224	0.11	94.2
OUI-SE-LVR611-110823	008	4	09/20/11 08:30:17	22.52	7.95	8.06	258	0.12	91.9
OUI-SE-LVR612-110823	009	4	09/20/11 08:30:35	22.51	7.97	8.05	236	0.11	92.1
OUI-SE-LVR602-110825	010	4	09/20/11 08:31:04	22.50	8.30	8.03	225	0.11	95.9
OUI-SE-LVR603-110825	011	4	09/20/11 08:31:22	22.47	8.04	7.91	204	0.10	92.9
Laboratory Control	000	5	09/21/11 08:25:04	22.95	6.75	7.47	212	0.10	78.6
OUI-SE-LVR609-110822	001	5	09/21/11 08:25:56	22.92	7.67	7.99	273	0.13	89.3
OUI-SE-LVR607-110822	002	5	09/21/11 08:26:12	22.91	7.79	8.01	255	0.12	90.7
OUI-SE-LVR608-110823	003	5	09/21/11 08:26:34	22.92	7.88	8.00	232	0.11	91.7
OUI-SE-LVR604-110824	004	5	09/21/11 08:26:56	22.95	7.88	7.95	227	0.11	91.8
OUI-SE-LVR605-110824	005	5	09/21/11 08:27:18	22.91	7.89	7.94	222	0.10	91.8
OUI-SE-LVR606-110824	006	5	09/21/11 08:27:38	22.93	7.90	7.93	216	0.10	92.0
OUI-SE-LVR610-110823	007	5	09/21/11 08:28:01	22.92	7.94	7.92	228	0.11	92.5
OUI-SE-LVR611-110823	008	5	09/21/11 08:28:28	22.90	7.77	8.03	258	0.12	90.4
OUI-SE-LVR612-110823	009	5	09/21/11 08:28:54	22.92	7.96	8.01	231	0.11	92.7
OUI-SE-LVR602-110825	010	5	09/21/11 08:29:17	22.92	8.05	7.97	225	0.11	93.8
OUI-SE-LVR603-110825	011	5	09/21/11 08:29:32	22.86	8.06	7.93	232	0.11	93.8
Laboratory Control	000	6	09/22/11 09:02:20	24.47	5.69	7.49	213	0.10	68.3
OUI-SE-LVR609-110822	001	6	09/22/11 09:03:35	24.44	7.34	8.03	268	0.13	88.0
OUI-SE-LVR607-110822	002	6	09/22/11 09:04:14	24.42	7.20	8.09	251	0.12	86.2
OUI-SE-LVR608-110823	003	6	09/22/11 09:04:39	24.46	7.37	8.09	219	0.10	88.4
OUI-SE-LVR604-110824	004	6	09/22/11 09:05:39	24.49	7.33	8.02	230	0.11	87.9
OUI-SE-LVR605-110824	005	6	09/22/11 09:06:00	24.44	7.32	8.04	229	0.11	87.7
OUI-SE-LVR606-110824	006	6	09/22/11 09:06:32	24.48	7.41	8.04	227	0.11	88.9
OUI-SE-LVR610-110823	007	6	09/22/11 09:07:14	24.45	6.70	7.90	233	0.11	80.3
OUI-SE-LVR611-110823	008	6	09/22/11 09:08:16	24.41	6.99	8.15	257	0.12	83.7
OUI-SE-LVR612-110823	009	6	09/22/11 09:08:50	24.41	7.45	8.12	235	0.11	89.2
OUI-SE-LVR602-110825	010	6	09/22/11 09:09:16	24.41	7.42	8.06	230	0.11	88.9
OUI-SE-LVR603-110825	011	6	09/22/11 09:09:55	24.36	6.96	7.90	231	0.11	83.3
Laboratory Control	000	7	09/23/11 09:45:08	24.44	5.85	7.28	217	0.10	70.1
OUI-SE-LVR609-110822	001	7	09/23/11 09:46:38	24.42	7.46	8.02	276	0.13	89.4
OUI-SE-LVR607-110822	002	7	09/23/11 09:47:00	24.41	7.55	8.02	258	0.12	90.5
OUI-SE-LVR608-110823	003	7	09/23/11 09:47:30	24.43	7.71	8.02	241	0.11	92.3
OUI-SE-LVR604-110824	004	7	09/23/11 09:48:03	24.47	7.67	7.94	238	0.11	92.0
OUI-SE-LVR605-110824	005	7	09/23/11 09:48:40	24.45	7.66	7.96	239	0.11	91.9

Field ID	Sample Number	Day	Date/Time M/D/Y	Temp C	DO Conc mg/L	pH SU	SpCond uS/cm	Salinity ppt	DO% %
OUI-SE-LVR606-110824	006	7	09/23/11 09:49:13	24.48	7.76	7.95	235	0.11	93.0
OUI-SE-LVR610-110823	007	7	09/23/11 09:49:51	24.47	7.29	7.80	250	0.12	87.4
OUI-SE-LVR611-110823	008	7	09/23/11 09:50:51	24.42	7.51	8.06	265	0.13	90.0
OUI-SE-LVR612-110823	009	7	09/23/11 09:51:25	24.43	7.80	8.04	241	0.11	93.5
OUI-SE-LVR602-110825	010	7	09/23/11 09:51:59	24.41	7.78	7.99	235	0.11	93.2
OUI-SE-LVR603-110825	011	7	09/23/11 09:52:33	24.37	7.60	7.88	237	0.11	90.9
Laboratory Control	000	8	09/24/11 10:34:37	24.35	6.06	7.39	219	0.10	72.5
OUI-SE-LVR609-110822	001	8	09/24/11 10:35:57	24.39	7.52	8.06	278	0.13	90.0
OUI-SE-LVR607-110822	002	8	09/24/11 10:36:20	24.37	7.36	8.08	259	0.12	88.1
OUI-SE-LVR608-110823	003	8	09/24/11 10:37:07	24.39	7.55	8.07	243	0.11	90.4
OUI-SE-LVR604-110824	004	8	09/24/11 10:37:28	24.43	7.63	8.01	239	0.11	91.5
OUI-SE-LVR605-110824	005	8	09/24/11 10:37:56	24.38	7.59	8.02	239	0.11	90.9
OUI-SE-LVR606-110824	006	8	09/24/11 10:38:22	24.43	7.56	7.99	223	0.10	90.6
OUI-SE-LVR610-110823	007	8	09/24/11 10:38:54	24.39	7.47	7.89	243	0.11	89.5
OUI-SE-LVR611-110823	008	8	09/24/11 10:39:37	24.37	7.08	8.11	267	0.13	84.7
OUI-SE-LVR612-110823	009	8	09/24/11 10:40:04	24.35	7.43	8.12	241	0.11	88.9
OUI-SE-LVR602-110825	010	8	09/24/11 10:40:43	24.33	7.44	8.08	231	0.11	89.0
OUI-SE-LVR603-110825	011	8	09/24/11 10:41:33	24.29	7.18	7.97	235	0.11	85.7
Laboratory Control	000	9	09/25/11 08:18:42	24.41	6.65	7.53	216	0.10	79.6
OUI-SE-LVR609-110822	001	9	09/25/11 08:19:30	24.47	7.49	7.95	275	0.13	89.8
OUI-SE-LVR607-110822	002	9	09/25/11 08:19:51	24.47	7.66	7.98	257	0.12	91.8
OUI-SE-LVR608-110823	003	9	09/25/11 08:20:12	24.51	7.79	8.01	243	0.11	93.5
OUI-SE-LVR604-110824	004	9	09/25/11 08:20:37	24.55	7.84	7.96	239	0.11	94.1
OUI-SE-LVR605-110824	005	9	09/25/11 08:21:01	24.52	7.92	7.95	241	0.11	95.0
OUI-SE-LVR606-110824	006	9	09/25/11 08:21:19	24.53	7.83	7.92	239	0.11	94.0
OUI-SE-LVR610-110823	007	9	09/25/11 08:21:54	24.47	7.57	7.80	245	0.12	90.8
OUI-SE-LVR611-110823	008	9	09/25/11 08:22:30	24.40	7.69	8.00	270	0.13	92.1
OUI-SE-LVR612-110823	009	9	09/25/11 08:22:51	24.43	7.86	8.00	249	0.12	94.2
OUI-SE-LVR602-110825	010	9	09/25/11 08:23:07	24.42	7.97	7.99	244	0.11	95.4
OUI-SE-LVR603-110825	011	9	09/25/11 08:23:32	24.38	7.86	7.93	245	0.12	94.1
Laboratory Control	000	10	09/26/11 10:16:10	24.17	6.28	7.41	227	0.11	74.8
OUI-SE-LVR609-110822	001	10	09/26/11 10:17:30	24.23	7.46	8.09	276	0.13	89.0
OUI-SE-LVR607-110822	002	10	09/26/11 10:17:59	24.21	7.64	8.09	254	0.12	91.1
OUI-SE-LVR608-110823	003	10	09/26/11 10:18:26	24.25	7.78	8.11	241	0.11	92.9
OUI-SE-LVR604-110824	004	10	09/26/11 10:19:06	24.30	7.69	8.04	237	0.11	91.9
OUI-SE-LVR605-110824	005	10	09/26/11 10:19:36	24.24	7.48	7.93	239	0.11	89.3
OUI-SE-LVR606-110824	006	10	09/26/11 10:20:28	24.29	5.91	7.68	238	0.11	70.6
OUI-SE-LVR610-110823	007	10	09/26/11 10:21:06	24.29	6.12	7.66	238	0.11	73.2
OUI-SE-LVR611-110823	008	10	09/26/11 10:21:48	24.28	7.30	8.08	269	0.13	87.2
OUI-SE-LVR612-110823	009	10	09/26/11 10:22:26	24.29	7.80	8.13	243	0.11	93.2
OUI-SE-LVR602-110825	010	10	09/26/11 10:22:59	24.25	7.85	8.09	235	0.11	93.8
OUI-SE-LVR603-110825	011	10	09/26/11 10:23:38	24.19	7.50	7.95	240	0.11	89.5

Note: "na" Indicates that the value is not available.

*Chironomus dilutus* Day 10

STUDY: 21321

PROJECT: FC 1640 LVR Toxicity Test

DATE: 09/26/11

CLIENT: Geosyntec Consultants

Sample Code	Rep	Pos	Survived	Initials
21319-007	1	1	9	CUS
21319-003	1	2	9	CUS
21319-008	1	3	8	CUS
21319-010	1	4	0	CUS
21319-002	1	5	0	CUS
21319-011	1	6	10	CUS
21319-001	1	7	9 (8/1)	CUS
21319-005	1	8	7	CUS
21319-009	1	9	9	CUS
21319-006	1	10	6	CUS
21319-000	1	11	8 (7-1)	CUS
21319-004	1	12	0	CUS
21319-011	2	13	10	CUS
21319-008	2	14	10	CUS
21319-009	2	15	10	CUS
21319-003	2	16	10	CUS
21319-007	2	17	0	CUS
21319-004	2	18	9	CUS
21319-002	2	19	0	CUS
21319-005	2	20	11	RAM
21319-010	2	21	10	
21319-006	2	22	10	
21319-001	2	23	10	
21319-000	2	24	9	CUS
21319-000	3	25	7 (6/1)	CUS
21319-001	3	26	10	CUS
21319-009	3	27	10	CUS
21319-006	3	28	9	CUS
21319-002	3	29	0	CUS
21319-011	3	30	0	RAM
21319-003	3	31	10	RAM
21319-004	3	32	10	RAM
21319-005	3	33	9	CUS
21319-008	3	34	9	CUS
21319-007	3	35	10	CUS
21319-010	3	36	10	CUS
21319-001	4	37	10	CUS
21319-004	4	38	1	CUS
21319-000	4	39	10 (6/4)	CUS
21319-005	4	40	10	CUS

*Chironomus dilutus* Day 10

STUDY: 21321

PROJECT: FC 1640 LVR Toxicity Test

DATE: 09/26/11

CLIENT: Geosyntec Consultants

Sample Code	Rep	Pos	Survived	Initials
21319-010	4	41	10	KHS
21319-011	4	42	8	KHS
21319-003	4	43	9	KHS
21319-009	4	44	7	KHS
21319-007	4	45	10	KHS
21319-002	4	46	0	KHS
21319-008	4	47	10	KHS
21319-006	4	48	10	KHS
21319-001	5	49	39 10	KHS
21319-004	5	50	10	KHS
21319-002	5	51	7	KHS
21319-005	5	52	10	KHS
21319-011	5	53	10	KHS
21319-006	5	54	9	KHS
21319-010	5	55	9	KHS
21319-008	5	56	11	KHS
21319-003	5	57	10	KHS
21319-007	5	58	9	RAM
21319-009	5	59	9	RAM
21319-000	5	60	8 (7/1)	KHS
21319-003	6	61	0 8	KHS
21319-010	6	62	1	KHS
21319-007	6	63	10	KHS
21319-000	6	64	8 (6/2)	KHS
21319-004	6	65	1	KHS
21319-009	6	66	10	KHS
21319-008	6	67	10	KHS
21319-005	6	68	9	KHS
21319-011	6	69	10	KHS
21319-006	6	70	10	KHS
21319-002	6	71	4	KHS
21319-001	6	72	9	KHS
21319-002	7	73	6	KHS
21319-004	7	74	5	KHS
21319-009	7	75	10	KHS
21319-003	7	76	9	KHS
21319-005	7	77	10	KHS
21319-000	7	78	10 (9-1)	KHS
21319-008	7	79	12	KHS
21319-007	7	80	10	KHS

*Chironomus dilutus* Day 10

STUDY: 21321

PROJECT: FC 1640 LVR Toxicity Test

DATE: 09/26/11

CLIENT: Geosyntec Consultants

Sample Code	Rep	Pos	Survived	Initials
21319-006	7	81	2	CHS
21319-011	7	82	10	CHS
21319-001	7	83	9	CHS
21319-010	7	84	10	CHS
21319-011	8	85	2	CHS
21319-010	8	86	8	CHS
21319-000	8	87	10 (8/2)	CHS
21319-004	8	88	10	CHS
21319-002	8	89	8	CHS
21319-006	8	90	9	CHS
21319-008	8	91	9	CHS
21319-003	8	92	8	CHS
21319-001	8	93	10	CHS
21319-009	8	94	10	CHS
21319-007	8	95	10	CHS
21319-005	8	96	9	CHS

# ***Chironomus dilutus* Sediment Evaluation**

**STUDY:** 21321

**CLIENT:** Geosyntec Consultants

**PROJECT:** FC 1640 LVR Toxicity Test

**START DATE:** 09/16/11

	REP	TARE WEIGHT (mg)	C. dilutus + FOIL (mg)	NET WEIGHT (mg)	# C. dilutus	MEAN DRY WEIGHT PER Individual (mg)
START ORGANISMS	A	207.8	<sup>#81</sup> 208.38	0.58	10	0.058
	B	208.8	<sup>#118</sup> 209.58	0.78	10	0.078
	C	207.4	<sup>#124</sup> 208.02	0.62	10	0.062
	D	208.9	<sup>#130</sup> 209.44	0.54	10	0.054
RECORDED BY:	JTP	DM	Overall Mean Dry Weight Per Individual:			
DATE:	09/20/11	09.24.11	0.063			

Organisms were preserved on 09/16/11 and retained for weight data analysis.  
RAM

STUDY: 21321  
 CLIENT: GeoSyntec  
 PROJECT: FC 1640 LVR  
 ASSAY: 10-day Acute Exposure  
 SPECIES: C. dilutus  
 TASK: Dry Weight Data - AccuSeries Balance Output File  
 BALANCE: AccuSeries Model 225D  
 Serial #: 17008376.00

Date/Init: Position #	09/28/11 KAS Total Wt (mg)	09/26/11 DM Tare Wt (mg)	09/29/11 RAM Ash Wt (mg)	Duplicates		
				Total Wt (mg)	Tare Wt (mg)	Ash Wt (mg)
-001	238.40	210.40	214.44			
-002	236.43	210.19	214.51			
-003	236.67	210.56	214.06			
-004		210.92				
-005		211.18				
-006	237.02	211.22	217.55			
-007	234.69	210.73	214.85			
-008	223.69	210.99	213.07			
-009	237.47	210.74	216.34			
-010	235.31	211.41	215.20			215.23
-011	239.38	210.75	212.90			
-012		210.24				
-013	226.62	210.81	213.55			
-014	242.13	210.97	216.36			
-015	240.00	210.69	214.93			
-016	241.32	209.99	216.18			
-017	229.19	210.88	214.22			
-018	226.03	210.92	213.44			
-019		210.74				
-020	236.83	210.88	217.46			
-021	234.23	211.28	216.76			
-022	237.05	211.16	216.43			
-023	239.82	210.93	216.28	239.82		
-024	249.05	211.01	213.41			
-025	232.27	210.55	212.93			
-026	232.05	210.93	215.52			
-027	231.81	210.43	215.59			
-028	230.13	210.75	214.21			214.22
-029		210.74				
-030		211.34				
-031	231.86	210.78	215.90			
-032	228.40	210.93	213.52	228.4		
-033	226.74	209.98	213.83			
-034	226.92	211.06	215.28			
-035	226.94	210.43	213.30			
-036	222.70	211.41	214.21			
-037	232.07	210.90	216.58			
-038	211.21	211.02	211.18			
-039	222.98	210.50	211.34			
-040	227.83	210.34	213.81			
-041	228.36	211.17	216.07			
-042	218.34	210.34	213.23	218.34		
-043	227.54	210.70	214.87			

-044	223.75	210.70	213.45	
-045	227.76	210.99	214.28	
-046		210.71		
-047	236.21	210.36	216.65	
-048	230.60	210.91	212.74	212.76
-049	235.54	210.88	217.83	
-050	228.80	210.80	213.15	
-051	219.40	210.12	213.44	
-052	232.88	210.51	215.92	
-053	231.57	210.69	214.83	
-054	227.16	210.67	213.01	
-055	225.54	211.06	215.56	
-056	232.41	210.52	215.75	
-057	234.41	211.13	214.54	
-058	231.38	210.65	214.16	
-059	233.41	210.51	216.34	
-060	236.79	211.46	212.94	
-061	227.22	210.41	214.78	227.22
-062	211.56	211.06	211.18	
-063	226.96	210.37	213.38	
-064	225.51	210.60	211.50	
-065	210.34	210.13	210.21	
-066	223.58	210.59	213.27	213.27
-067	222.94	210.54	214.37	
-068	223.11	211.30	214.15	
-069	223.49	210.92	215.06	
-070	223.77	210.94	213.40	
-071	213.91	210.63	211.87	
-072	231.74	211.03	216.82	
-073	214.61	211.10	212.54	214.61
-074	214.72	210.77	211.47	
-075	224.41	210.52	213.99	
-076	229.81	210.89	215.81	
-077	224.18	210.26	212.93	
-078	235.41	210.57	213.10	
-079	226.91	211.00	214.47	
-080	224.56	210.92	213.62	213.64
-081	214.98	210.95	211.72	214.98
-082	222.71	210.57	213.67	
-083	229.05	210.45	215.78	
-084	225.22	211.16	214.51	
-085	211.97	210.55	211.13	
-086	223.26	210.31	213.72	
-087	239.72	211.13	213.30	
-088	224.03	210.15	212.49	
-089	219.61	210.47	214.12	
-090	222.17	210.83	213.19	
-091	223.05	210.64	214.24	223.06
-092	223.76	211.46	216.14	216.15
-093	230.29	210.66	217.83	
-094	225.68	211.41	215.68	
-095	222.74	211.22	214.29	
-096	223.05	211.08	214.19	

**CETIS Summary Report**

Report Date:

07 Nov-11 13:14 (p 2 of 3)

Test Code:

21321Cd | 09-4653-9154

Chironomus 10-d Survival and Growth Sediment Test										EnviroSystems, Inc.
Mean AF Biomass-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319-000	8	2.246	1.962	2.53	1.164	3.564	0.2692	0.7613	33.89%	0.0%
21319-007	8	1.453	1.281	1.625	0.845	2.396	0.1631	0.4614	31.75%	35.31%
21319-008	8	1.531	1.284	1.778	0.857	2.577	0.2339	0.6616	43.21%	31.84%
21319-009	8	1.507	1.29	1.723	1	2.507	0.2048	0.5791	38.44%	32.93%
21319-001	8	1.672	1.537	1.807	1.246	2.354	0.1282	0.3627	21.69%	25.56%
21319-002	4	0.389	0.3096	0.4684	0.204	0.596	0.1064	0.2128	54.69%	82.68%
21319-003	8	1.62	1.406	1.835	0.762	2.514	0.2032	0.5747	35.47%	27.86%
21319-004	7	0.8296	0.5714	1.088	0.003001	1.565	0.2613	0.6915	83.35%	63.07%
21319-005	8	1.265	1.139	1.39	0.886	1.761	0.1189	0.3363	26.59%	43.69%
21319-006	8	1.391	1.166	1.616	0.326	2.062	0.2127	0.6017	43.26%	38.08%
21319-010	7	0.9837	0.7931	1.174	0.038	1.747	0.193	0.5106	51.9%	56.2%
21319-011	7	1.039	0.7953	1.282	0.084	1.947	0.2463	0.6515	62.73%	53.76%
Mean AF Weight-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319-000	8	3.175	2.96	3.39	2.335	3.96	0.2035	0.5755	18.13%	0.0%
21319-007	8	1.51	1.302	1.718	0.845	2.662	0.1971	0.5576	36.92%	52.43%
21319-008	8	1.63	1.35	1.91	0.857	2.826	0.2651	0.7497	45.99%	48.66%
21319-009	8	1.615	1.392	1.837	1	2.507	0.2105	0.5952	36.86%	49.14%
21319-001	8	1.773	1.613	1.933	1.246	2.48	0.1513	0.428	24.14%	44.15%
21319-002	4	0.5982	0.5164	0.6799	0.345	0.8514	0.1095	0.2189	36.6%	81.16%
21319-003	8	1.75	1.553	1.948	0.9525	2.514	0.1872	0.5295	30.25%	44.87%
21319-004	7	0.9166	0.675	1.158	0.03001	1.565	0.2445	0.647	70.59%	71.13%
21319-005	8	1.364	1.252	1.477	0.9844	1.761	0.1064	0.3011	22.07%	57.03%
21319-006	8	1.608	1.458	1.758	0.9978	2.062	0.1418	0.4011	24.94%	49.35%
21319-010	7	1.082	0.9282	1.237	0.38	1.747	0.1561	0.4131	38.16%	65.91%
21319-011	7	1.105	0.8964	1.313	0.42	1.947	0.211	0.5582	50.52%	65.2%
Proportion Survived Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319-000	8	0.875	0.8315	0.9185	0.7	1	0.04119	0.1165	13.31%	0.0%
21319-007	8	0.975	0.9577	0.9923	0.9	1	0.01637	0.04629	4.75%	-11.43%
21319-008	8	0.95	0.9218	0.9782	0.8	1	0.02673	0.07559	7.96%	-8.57%
21319-009	8	0.9375	0.8979	0.9771	0.7	1	0.0375	0.1061	11.31%	-7.14%
21319-001	8	0.9625	0.9432	0.9818	0.9	1	0.0183	0.05175	5.38%	-10.0%
21319-002	8	0.3125	0.181	0.444	0	0.8	0.1246	0.3523	112.7%	64.29%
21319-003	8	0.9125	0.8813	0.9437	0.8	1	0.0295	0.08345	9.15%	-4.29%
21319-004	8	0.575	0.4059	0.7441	0	1	0.1601	0.4528	78.74%	34.29%
21319-005	8	0.925	0.8863	0.9637	0.7	1	0.0366	0.1035	11.19%	-5.71%
21319-006	8	0.8625	0.7608	0.9642	0.2	1	0.09625	0.2722	31.56%	1.43%
21319-010	8	0.725	0.5669	0.8831	0	1	0.1497	0.4234	58.4%	17.14%
21319-011	8	0.75	0.5967	0.9033	0	1	0.1452	0.4106	54.74%	14.29%

**CETIS Summary Report**

Report Date:

07 Nov-11 13:14 (p 3 of 3)

Test Code:

21321Cd | 09-4653-9154

Chironomus 10-d Survival and Growth Sediment Test								EnviroSystems, Inc.
Mean AF Biomass-mg Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
21319-000	2.648	3.564	1.934	1.164	2.385	1.401	2.231	2.642
21319-007	2.396	1.497	1.364	1.348	1.722	1.358	1.094	0.845
21319-008	2.261	2.577	1.164	1.956	1.515	0.857	1.037	0.881
21319-009	2.113	2.507	1.622	1.03	1.707	1.031	1.042	1
21319-001	1.984	2.354	1.653	1.549	1.771	1.492	1.327	1.246
21319-002					0.596	0.204	0.207	0.549
21319-003	2.192	2.514	1.596	1.267	1.987	1.244	1.4	0.762
21319-004		1.259	1.488	0.003001	1.565	0.013	0.325	1.154
21319-005	1.062	1.761	1.291	1.402	1.696	0.896	1.125	0.886
21319-006	2.011	2.062	1.592	1.786	1.415	1.037	0.326	0.898
21319-010		1.747	0.849	1.229	0.998	0.038	1.071	0.954
21319-011	1.947	1.307		0.511	1.674	0.843	0.904	0.084
Mean AF Weight-mg Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
21319-000	3.783	3.96	3.223	2.91	3.407	2.335	2.479	3.302
21319-007	2.662	1.497	1.364	1.348	1.913	1.358	1.094	0.845
21319-008	2.826	2.577	1.293	1.956	1.515	0.857	1.037	0.9789
21319-009	2.348	2.507	1.622	1.471	1.897	1.031	1.042	1
21319-001	2.48	2.354	1.653	1.549	1.771	1.658	1.474	1.246
21319-002					0.8514	0.51	0.345	0.6863
21319-003	2.436	2.514	1.596	1.408	1.987	1.555	1.556	0.9525
21319-004		1.399	1.488	0.030001	1.565	0.13	0.65	1.154
21319-005	1.517	1.761	1.434	1.402	1.696	0.9956	1.125	0.9844
21319-006	2.011	2.062	1.769	1.786	1.572	1.037	1.63	0.9978
21319-010		1.747	0.849	1.229	1.109	0.38	1.071	1.192
21319-011	1.947	1.307		0.6388	1.674	0.843	0.904	0.42
Proportion Survived Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
21319-000	0.8	0.9	0.7	1	0.8	0.8	1	1
21319-007	0.9	1	1	1	0.9	1	1	1
21319-008	0.8	1	0.9	1	1	1	1	0.9
21319-009	0.9	1	1	0.7	0.9	1	1	1
21319-001	0.9	1	1	1	1	0.9	0.9	1
21319-002	0	0	0	0	0.7	0.4	0.6	0.8
21319-003	0.9	1	1	0.9	1	0.8	0.9	0.8
21319-004	0	0.9	1	0.1	1	0.1	0.5	1
21319-005	0.7	1	0.9	1	1	0.9	1	0.9
21319-006	1	1	0.9	1	0.9	1	0.2	0.9
21319-010	0	1	1	1	0.9	0.1	1	0.8
21319-011	1	1	0	0.8	1	1	1	0.2

**CETIS Summary Report**

 Report Date: 27 Oct-11 17:39 (p 1 of 3)  
 Test Code: 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test						EnviroSystems, Inc.	
Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project	
21319-000	18-8566-3388	13 Sep-11 12:00	13 Sep-11 12:00	73h	GeoSyntec Consultants, Inc.	Ecological Risk Asse	
21319Reach 4	15-4421-3027	13 Sep-11 12:00	13 Sep-11 12:00	73h			
21319Reach 3	15-4840-6035	13 Sep-11 12:00	13 Sep-11 12:00	73h			
21319Reach 2	14-0239-1443	13 Sep-11 12:00	13 Sep-11 12:00	73h			
21319Reach 1	02-8617-5543	13 Sep-11 12:00	13 Sep-11 12:00	73h			
Sample Code	Material Type	Sample Source		Station Location	Latitude	Longitude	
21319-000	Freshwater Sediment FC1640 LVR Toxicity Test			Laboratory Control			
21319Reach 4	Freshwater Sediment FC1640 LVR Toxicity Test			Reach 4			
21319Reach 3	Freshwater Sediment FC1640 LVR Toxicity Test			Reach 3			
21319Reach 2	Freshwater Sediment FC1640 LVR Toxicity Test			Reach 2			
21319Reach 1	Freshwater Sediment FC1640 LVR Toxicity Test			Reach 1			
Sample Code	vs	Sample Code	P-Value	Alpha	Decision	Analysis ID	Method
21319Reach 4		21319Reach 3	0.2900	0.05	Non-Significant Effect	20-0246-9622	Equal Variance t Two-Sample Test
		21319Reach 3	0.3845	0.05	Non-Significant Effect	18-4554-7942	Equal Variance t Two-Sample Test
		21319Reach 3	0.0027	0.05	Significant Effect	09-4542-2126	Wilcoxon Rank Sum Two-Sample Test
		21319Reach 2	0.0292	0.05	Significant Effect	17-9665-5946	Equal Variance t Two-Sample Test
		21319Reach 2	0.0552	0.05	Non-Significant Effect	02-1491-1628	Equal Variance t Two-Sample Test
		21319Reach 2	0.0391	0.05	Significant Effect	01-1444-7576	Wilcoxon Rank Sum Two-Sample Test
		21319Reach 2	0.0612	0.05	Non-Significant Effect	01-8773-2215	Wilcoxon Rank Sum Two-Sample Test
		21319Reach 1	0.0066	0.05	Significant Effect	11-9941-6309	Equal Variance t Two-Sample Test
		21319Reach 1	0.0251	0.05	Significant Effect	08-3710-1147	Equal Variance t Two-Sample Test
		21319Reach 1	0.1012	0.05	Non-Significant Effect	20-5793-9641	Wilcoxon Rank Sum Two-Sample Test
Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
01-1444-7576	Proportion Survived	Control Resp	0.9542	0.7 - NL	Yes	Passes Acceptability Criteria	
01-8773-2215	Proportion Survived	Control Resp	0.9542	0.7 - NL	Yes	Passes Acceptability Criteria	
09-4542-2126	Proportion Survived	Control Resp	0.9542	0.7 - NL	Yes	Passes Acceptability Criteria	
20-5793-9641	Proportion Survived	Control Resp	0.9542	0.7 - NL	Yes	Passes Acceptability Criteria	

**CETIS Summary Report**

Report Date:

27 Oct-11 17:39 (p 2 of 3)

Test Code:

21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test										EnviroSystems, Inc.
Mean AF Biomass-mg Summary										
Conc-NA	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319-000	8	2.246	1.962	2.53	1.164	3.564	0.2692	0.7613	33.89%	0.0%
21319Reach 4	24	1.497	1.292	1.702	0.845	2.577	0.112	0.5488	36.66%	33.36%
21319Reach 3	20	1.395	1.146	1.644	0.204	2.514	0.149	0.6664	47.78%	37.91%
21319Reach 2	23	1.176	0.9587	1.394	0.003001	2.062	0.1215	0.5826	49.53%	47.63%
21319Reach 1	14	1.011	0.8009	1.221	0.038	1.947	0.1505	0.5631	55.69%	54.98%
Mean AF Weight-mg Summary										
Conc-NA	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319-000	8	3.175	2.834	3.515	1.164	3.975	0.3226	0.9124	28.74%	0.0%
21319Reach 4	24	1.585	1.356	1.814	0.845	2.826	0.1252	0.6136	38.71%	50.07%
21319Reach 3	20	1.529	1.291	1.767	0.345	2.514	0.1426	0.6376	41.7%	51.83%
21319Reach 2	23	1.313	1.116	1.509	0.03001	2.062	0.1097	0.5262	40.08%	58.64%
21319Reach 1	14	1.185	0.9833	1.386	0.38	2.122	0.1441	0.5391	45.51%	62.68%
Proportion Survived Summary										
Conc-NA	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319-000	8	0.875	0.8315	0.9185	0.7	1	0.04119	0.1165	13.31%	0.0%
21319Reach 4	24	0.9542	0.9251	0.9833	0.7	1	0.0159	0.0779	8.16%	-9.05%
21319Reach 3	24	0.7292	0.5936	0.8647	0	1	0.07408	0.3629	49.77%	16.67%
21319Reach 2	24	0.7875	0.6623	0.9127	0	1	0.06845	0.3353	42.58%	10.0%
21319Reach 1	16	0.7375	0.587	0.888	0	1	0.1008	0.4031	54.66%	15.71%

**CETIS Summary Report**

Report Date:

27 Oct-11 17:39 (p 3 of 3)

Test Code:

21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test										EnviroSystems, Inc.	
Mean AF Biomass-mg Detail											
Conc-NA	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
21319-000	2.648	3.564	1.934	1.164	2.385	1.401	2.231	2.642			
21319Reach 4	2.396	1.497	1.364	1.348	1.722	1.358	1.094	0.845	2.261	2.577	
	1.164	1.956	1.515	0.857	1.037	0.881	2.113	2.507	1.622	1.03	
	1.707	1.031	1.042	1							
21319Reach 3	1.984	2.354	1.653	1.549	1.771	1.492	1.327	1.246			
			0.596	0.204	0.207	0.549	2.192	2.514	1.596	1.267	
21319Reach 2	1.987	1.244	1.4	0.762							
		1.259	1.488	0.003001	1.565	0.013	0.325	1.154	1.062	1.761	
	1.291	1.402	1.696	0.896	1.125	0.886	2.011	2.062	1.592	1.786	
21319Reach 1	1.415	1.037	0.326	0.898							
		1.747	0.849	1.229	0.998	0.038	1.071	0.954	1.947	1.307	
		0.511	1.674	0.843	0.904	0.084					
Mean AF Weight-mg Detail											
Conc-NA	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
21319-000	3.783	3.96	3.223	1.164	3.975	2.802	3.187	3.302			
21319Reach 4	2.662	1.497	1.364	1.348	1.913	1.358	1.094	0.845	2.826	2.577	
	1.293	1.956	1.515	0.857	1.037	0.9789	2.348	2.507	1.622	1.471	
	1.897	1.031	1.042	1							
21319Reach 3	2.48	2.354	1.653	1.549	1.771	1.658	1.474	1.246			
			0.8514	0.51	0.345	0.6863	2.436	2.514	1.596	1.408	
21319Reach 2	1.987	1.555	1.556	0.9525							
		1.399	1.488	0.03001	1.565	0.13	0.65	1.154	1.517	1.761	
	1.434	1.402	1.696	0.9956	1.125	0.9844	2.011	2.062	1.769	1.786	
21319Reach 1	1.572	1.037	1.63	0.9978							
		1.747	2.122	1.229	1.109	0.38	1.071	1.192	1.947	1.307	
		0.6388	1.674	0.843	0.904	0.42					
Proportion Survived Detail											
Conc-NA	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	
21319-000	0.8	0.9	0.7	1	0.8	0.8	1	1			
21319Reach 4	0.9	1	1	1	0.9	1	1	1	0.8	1	
	0.9	1	1	1					1	0.7	
21319Reach 3	0.9	1	1	1	1	0.9	0.9	1	0	0	
	0	0	0.7	0.4	0.6	0.8	0.9	1	1	0.9	
21319Reach 2	1	0.8	0.9	0.8							
	0	0.9	1	0.1	1	0.1	0.5	1	0.7	1	
	0.9	1	1	0.9	1	0.9	1	1	0.9	1	
21319Reach 1	0.9	1	0.2	0.9							
	0	1	1	1	0.9	0.1	1	0.8	1	1	
	0	0.8	1	1	1	0.2					

# CETIS Analytical Report

Report Date: 20 Dec-11 15:31 (p 1 of 3)  
 Test Code: 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
Analysis ID:	06-6887-8029	Endpoint: Proportion Survived			CETIS Version: CETISv1.8.0					
Analyzed:	07 Nov-11 13:19	Analysis: Nonparametric-Two Sample			Official Results: Yes					
<b>Data Transform</b>										
Zeta		Alt Hyp	MC Trials	<b>Test Result</b>			<b>PMSD</b>			
Angular (Corrected)		0	C > T	Not Run		Sample passes proportion survived endpoint	10.2%			
<b>Wilcoxon Rank Sum Two-Sample Test</b>										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 3	2.781	1.645	46	4	0.0027	Significant Effect		
<b>Auxiliary Tests</b>										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			2.761	3.112	0.1967	No Outliers Detected				
<b>ANOVA Table</b>										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	0.9910985		0.9910985	1	9.214	0.0039	Significant Effect			
Error	4.948088		0.1075671	46						
Total	5.939186		1.098666	47						
<b>Distributional Tests</b>										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		14.87	3.042	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk W Normality		0.782	0.9345	<0.0001	Non-normal Distribution				
<b>Proportion Survived Summary</b>										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	0.9542	0.9245	0.9838	0.7	1	0.0159	0.0779	8.16%	0.0%
21319Reach 3	24	0.7292	0.5911	0.8672	0	1	0.07408	0.3629	49.77%	23.58%
<b>Angular (Corrected) Transformed Summary</b>										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.342	1.298	1.386	0.9912	1.426	0.02377	0.1164	8.68%	0.0%
21319Reach 3	24	1.055	0.8838	1.225	0.1588	1.412	0.09165	0.449	42.58%	21.42%
<b>Proportion Survived Detail</b>										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	0.9	1	1	1	0.9	1	1	1	0.8	1
	0.9	1	1	1	1	0.9	0.9	1	1	0.7
	0.9	1	1	1						
21319Reach 3	0.9	1	1	1	1	0.9	0.9	1	0	0
	0	0	0.7	0.4	0.6	0.8	0.9	1	1	0.9
	1	0.8	0.9	0.8						

# CETIS Analytical Report

Report Date: 20 Dec-11 15:31 (p 2 of 3)  
 Test Code: 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
Analysis ID: 15-7942-0153 Analyzed: 07 Nov-11 13:19	Endpoint: Proportion Survived Analysis: Nonparametric-Two Sample			CETIS Version: CETISv1.8.0 Official Results: Yes						
Data Transform	Zeta	Alt Hyp	MC Trials	Test Result			PMSD			
Angular (Corrected) 0 C > T Not Run Sample passes proportion survived endpoint 9.18%										
Wilcoxon Rank Sum Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 2	1.761	1.645	46	3	0.0391	Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			3.309	3.112	0.0210	Outlier Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	0.4962946		0.4962946	1	5.541	0.0229	Significant Effect			
Error	4.12019		0.08956935	46						
Total	4.616485		0.5858639	47						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		12.22	3.042	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk W Normality		0.7553	0.9345	<0.0001	Non-normal Distribution				
Proportion Survived Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	0.9542	0.9245	0.9838	0.7	1	0.0159	0.0779	8.16%	0.0%
21319Reach 2	24	0.7875	0.6599	0.9151	0	1	0.06845	0.3353	42.58%	17.47%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.342	1.298	1.386	0.9912	1.426	0.02377	0.1164	8.68%	0.0%
21319Reach 2	24	1.139	0.9838	1.293	0.1588	1.419	0.08306	0.4069	35.74%	15.15%
Proportion Survived Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	0.9	1	1	1	0.9	1	1	1	0.8	1
	0.9	1	1	1	1	0.9	0.9	1	1	0.7
	0.9	1	1	1						
21319Reach 2	0	0.9	1	0.1	1	0.1	0.5	1	0.7	1
	0.9	1	1	0.9	1	0.9	1	1	0.9	1
	0.9	1	0.2	0.9						

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:32 (p 1 of 1)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test								EnviroSystems, Inc.		
<b>Analysis ID:</b> 08-0983-7355	<b>Endpoint:</b> Proportion Survived			<b>CETIS Version:</b> CETISv1.8.0						
<b>Analyzed:</b> 07 Nov-11 13:19	<b>Analysis:</b> Nonparametric-Two Sample			<b>Official Results:</b> Yes						
<b>Data Transform</b>										
<b>Zeta</b>		<b>Alt Hyp</b>	<b>MC Trials</b>	<b>Test Result</b>			<b>PMSD</b>			
Angular (Corrected)		0	C > T	Not Run			Sample passes proportion survived endpoint			
<b>Wilcoxon Rank Sum Two-Sample Test</b>										
<b>Sample Code</b>	<b>vs</b>	<b>Sample Code</b>	<b>Test Stat</b>	<b>Critical</b>	<b>DF</b>	<b>Ties</b>	<b>P-Value</b>	<b>Decision(<math>\alpha:5\%</math>)</b>		
21319Reach 4		21319Reach 2	1.545	1.645	45	3	0.0612	Non-Significant Effect		
<b>ANOVA Table</b>										
<b>Source</b>	<b>Sum Squares</b>	<b>Mean Square</b>	<b>DF</b>	<b>F Stat</b>	<b>P-Value</b>	<b>Decision(<math>\alpha:5\%</math>)</b>				
Between	0.3035544	0.3035544	1	4.38	0.0420	Significant Effect				
Error	3.118485	0.06929966	45							
Total	3.422039	0.3728541	46							
<b>Distributional Tests</b>										
<b>Attribute</b>	<b>Test</b>		<b>Test Stat</b>	<b>Critical</b>	<b>P-Value</b>	<b>Decision(<math>\alpha:1\%</math>)</b>				
Variances	Variance Ratio F		9.412	3.065	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk W Normality		0.7195	0.9333	<0.0001	Non-normal Distribution				
<b>Proportion Survived Summary</b>										
<b>Sample Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
21319Reach 4	24	0.9542	0.9245	0.9838	0.7	1	0.0159	0.0779	8.16%	0.0%
21319Reach 2	23	0.8217	0.7088	0.9347	0.1	1	0.06191	0.2969	36.13%	13.88%
<b>Angular (Corrected) Transformed Summary</b>										
<b>Sample Code</b>	<b>Count</b>	<b>Mean</b>	<b>95% LCL</b>	<b>95% UCL</b>	<b>Min</b>	<b>Max</b>	<b>Std Err</b>	<b>Std Dev</b>	<b>CV%</b>	<b>%Effect</b>
21319Reach 4	24	1.342	1.298	1.386	0.9912	1.426	0.02377	0.1164	8.68%	0.0%
21319Reach 2	23	1.181	1.045	1.317	0.3218	1.419	0.07448	0.3572	30.24%	11.98%
<b>Proportion Survived Detail</b>										
<b>Sample Code</b>	<b>Rep 1</b>	<b>Rep 2</b>	<b>Rep 3</b>	<b>Rep 4</b>	<b>Rep 5</b>	<b>Rep 6</b>	<b>Rep 7</b>	<b>Rep 8</b>	<b>Rep 9</b>	<b>Rep 10</b>
21319Reach 4	0.9	1	1	1	0.9	1	1	1	0.8	1
	0.9	1	1	1	1	0.9	0.9	1	1	0.7
	0.9	1	1	1						
21319Reach 2	Outlier	0.9	1	0.1	1	0.1	0.5	1	0.7	1
	0.9	1	1	0.9	1	0.9	1	1	0.9	1
	0.9	1	0.2	0.9						
	0.9	1	0.2	0.9						

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:31 (p 3 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
<b>Analysis ID:</b> 18-3259-7002	<b>Endpoint:</b> Proportion Survived			<b>CETIS Version:</b> CETISv1.8.0						
<b>Analyzed:</b> 07 Nov-11 13:19	<b>Analysis:</b> Nonparametric-Two Sample			<b>Official Results:</b> Yes						
Data Transform		Zeta	Alt Hyp	MC Trials	Test Result		PMSD			
Angular (Corrected)		0	C > T	Not Run	Sample passes proportion survived endpoint		11.5%			
Wilcoxon Rank Sum Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 1	1.275	1.645	38	3	0.1012	Non-Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			2.88	3.036	0.0950	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	0.6603564		0.6603564	1	6.295	0.0165	Significant Effect			
Error	3.986054		0.1048962	38						
Total	4.646411		0.7652526	39						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		18.07	3.3	<0.0001	Unequal Variances				
Distribution	Shapiro-Wilk W Normality		0.7841	0.9236	<0.0001	Non-normal Distribution				
Proportion Survived Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	0.9542	0.9245	0.9838	0.7	1	0.0159	0.0779	8.16%	0.0%
21319Reach 1	16	0.7375	0.5842	0.8908	0	1	0.1008	0.4031	54.66%	22.71%
Angular (Corrected) Transformed Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.342	1.298	1.386	0.9912	1.426	0.02377	0.1164	8.68%	0.0%
21319Reach 1	16	1.08	0.8914	1.268	0.1588	1.412	0.1237	0.4949	45.84%	19.54%
Proportion Survived Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	0.9	1	1	1	0.9	1	1	1	0.8	1
	0.9	1	1	1	1	0.9	0.9	1	1	0.7
	0.9	1	1	1						
21319Reach 1	0	1	1	1	0.9	0.1	1	0.8	1	1
	0	0.8	1	1	1	0.2				

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:34 (p 1 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
<b>Analysis ID:</b> 10-6429-3389	<b>Endpoint:</b> Mean AF Weight-mg			<b>CETIS Version:</b> CETISv1.8.0						
<b>Analyzed:</b> 07 Nov-11 13:19	<b>Analysis:</b> Parametric-Two Sample			<b>Official Results:</b> Yes						
Data Transform		Zeta	Alt Hyp	MC Trials	Test Result		PMSD			
Untransformed		0	C > T	Not Run	Sample passes mean af weight-mg endpoint		20.1%			
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 3	0.2956	1.682	42	0.318	0.3845	Non-Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			2.011	3.076	1.0000	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	0.03408705		0.03408705	1	0.08739	0.7690	Non-Significant Effect			
Error	16.38226		0.3900537	42						
Total	16.41634		0.4241408	43						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		1.08	3.146	0.8516	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.9609	0.9295	0.1409	Normal Distribution				
Mean AF Weight-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.585	1.352	1.818	0.845	2.826	0.1252	0.6136	38.71%	0.0%
21319Reach 3	20	1.529	1.287	1.772	0.345	2.514	0.1426	0.6376	41.7%	3.53%
Mean AF Weight-mg Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	2.662	1.497	1.364	1.348	1.913	1.358	1.094	0.845	2.826	2.577
	1.293	1.956	1.515	0.857	1.037	0.9789	2.348	2.507	1.622	1.471
	1.897	1.031	1.042	1						
21319Reach 3	2.48	2.354	1.653	1.549	1.771	1.658	1.474	1.246	0.8514	0.51
	0.345	0.6863	2.436	2.514	1.596	1.408	1.987	1.555	1.556	0.9525

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:34 (p 2 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
<b>Analysis ID:</b> 12-1074-2929	<b>Endpoint:</b> Mean AF Weight-mg			<b>CETIS Version:</b> CETISv1.8.0						
<b>Analyzed:</b> 07 Nov-11 13:19	<b>Analysis:</b> Parametric-Two Sample			<b>Official Results:</b> Yes						
Data Transform		Zeta	Alt Hyp	MC Trials	Test Result		PMSD			
Untransformed		0	C > T	Not Run	Sample passes mean af weight-mg endpoint		17.7%			
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 2	1.629	1.679	45	0.2806	0.0552	Non-Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			2.266	3.103	0.9533	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	0.86944		0.86944	1	2.653	0.1104	Non-Significant Effect			
Error	14.74958		0.3277685	45						
Total	15.61902		1.197209	46						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		1.36	3.102	0.4743	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.9872	0.9333	0.8818	Normal Distribution				
Mean AF Weight-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.585	1.352	1.818	0.845	2.826	0.1252	0.6136	38.71%	0.0%
21319Reach 2	23	1.313	1.113	1.513	0.03001	2.062	0.1097	0.5262	40.08%	17.17%
Mean AF Weight-mg Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	2.662	1.497	1.364	1.348	1.913	1.358	1.094	0.845	2.826	2.577
	1.293	1.956	1.515	0.857	1.037	0.9789	2.348	2.507	1.622	1.471
	1.897	1.031	1.042	1						
21319Reach 2	1.399	1.488	0.03001	1.565	0.13	0.65	1.154	1.517	1.761	1.434
	1.402	1.696	0.9956	1.125	0.9844	2.011	2.062	1.769	1.786	1.572
	1.037	1.63	0.9978							

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:34 (p 3 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
Analysis ID:	02-1691-4489	Endpoint: Mean AF Weight-mg		CETIS Version: CETISv1.8.0						
Analyzed:	07 Nov-11 13:19	Analysis: Parametric-Two Sample		Official Results: Yes						
Data Transform										
Zeta		Alt Hyp	MC Trials	Test Result		PMSD				
Untransformed		0	C > T	Not Run		Sample passes mean af weight-mg endpoint				
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 1	2.579	1.688	36	0.3216	0.0071	Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			2.221	3.014	0.8434	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	2.134359		2.134359	1	6.65	0.0141	Significant Effect			
Error	11.55385		0.3209404	36						
Total	13.68821		2.455299	37						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		1.691	4.194	0.3275	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.9319	0.9202	0.0230	Normal Distribution				
Mean AF Weight-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.585	1.352	1.818	0.845	2.826	0.1252	0.6136	38.71%	0.0%
21319Reach 1	14	1.094	0.9142	1.273	0.38	1.947	0.1261	0.4719	43.15%	31.0%
Mean AF Weight-mg Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	2.662	1.497	1.364	1.348	1.913	1.358	1.094	0.845	2.826	2.577
	1.293	1.956	1.515	0.857	1.037	0.9789	2.348	2.507	1.622	1.471
	1.897	1.031	1.042	1						
21319Reach 1	1.747	0.849	1.229	1.109	0.38	1.071	1.192	1.947	1.307	0.6388
	1.674	0.843	0.904	0.42						

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:34 (p 1 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
<b>Analysis ID:</b> 06-6437-8147	<b>Endpoint:</b> Mean AF Biomass-mg			<b>CETIS Version:</b> CETISv1.8.0						
<b>Analyzed:</b> 07 Nov-11 13:19	<b>Analysis:</b> Parametric-Two Sample			<b>Official Results:</b> Yes						
Data Transform		Zeta	Alt Hyp	MC Trials	Test Result		PMSD			
Untransformed		0	C > T	Not Run	Sample passes mean af biomass-mg endpoint 20.6%					
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 3	0.5576	1.682	42	0.308	0.2900	Non-Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			1.992	3.076	1.0000	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	0.1137221		0.1137221	1	0.3109	0.5801	Non-Significant Effect			
Error	15.36362		0.3658004	42						
Total	15.47734		0.4795224	43						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		1.474	3.146	0.3726	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.975	0.9295	0.4495	Normal Distribution				
Mean AF Biomass-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.497	1.288	1.706	0.845	2.577	0.112	0.5488	36.66%	0.0%
21319Reach 3	20	1.395	1.141	1.648	0.204	2.514	0.149	0.6664	47.78%	6.82%
Mean AF Biomass-mg Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	2.396	1.497	1.364	1.348	1.722	1.358	1.094	0.845	2.261	2.577
	1.164	1.956	1.515	0.857	1.037	0.881	2.113	2.507	1.622	1.03
	1.707	1.031	1.042	1						
21319Reach 3	1.984	2.354	1.653	1.549	1.771	1.492	1.327	1.246	0.596	0.204
	0.207	0.549	2.192	2.514	1.596	1.267	1.987	1.244	1.4	0.762

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:34 (p 2 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
<b>Analysis ID:</b> 05-4812-9372	<b>Endpoint:</b> Mean AF Biomass-mg			<b>CETIS Version:</b> CETISv1.8.0						
<b>Analyzed:</b> 07 Nov-11 13:19	<b>Analysis:</b> Parametric-Two Sample			<b>Official Results:</b> Yes						
Data Transform		Zeta	Alt Hyp	MC Trials	Test Result		PMSD			
Untransformed		0	C > T	Not Run	Sample passes mean af biomass-mg endpoint 18.5%					
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 2	1.943	1.679	45	0.2772	0.0292	Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			2.097	3.103	1.0000	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	1.207073		1.207073	1	3.774	0.0583	Non-Significant Effect			
Error	14.3943		0.3198734	45						
Total	15.60138		1.526946	46						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		1.127	3.065	0.7768	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.9843	0.9333	0.7732	Normal Distribution				
Mean AF Biomass-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.497	1.288	1.706	0.845	2.577	0.112	0.5488	36.66%	0.0%
21319Reach 2	23	1.176	0.9546	1.398	0.003001	2.062	0.1215	0.5826	49.53%	21.42%
Mean AF Biomass-mg Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	2.396	1.497	1.364	1.348	1.722	1.358	1.094	0.845	2.261	2.577
	1.164	1.956	1.515	0.857	1.037	0.881	2.113	2.507	1.622	1.03
	1.707	1.031	1.042	1						
21319Reach 2	1.259	1.488	0.003001	1.565	0.013	0.325	1.154	1.062	1.761	1.291
	1.402	1.696	0.896	1.125	0.886	2.011	2.062	1.592	1.786	1.415
	1.037	0.326	0.898							

**CETIS Analytical Report**

**Report Date:** 20 Dec-11 15:34 (p 3 of 3)  
**Test Code:** 21319Cd | 14-7135-2716

Chironomus 10-d Survival and Growth Sediment Test							EnviroSystems, Inc.			
Analysis ID:	09-9518-2618	Endpoint:	Mean AF Biomass-mg		CETIS Version:	CETISv1.8.0				
Analyzed:	07 Nov-11 13:19	Analysis:	Parametric-Two Sample		Official Results:	Yes				
Data Transform										
Zeta		Alt Hyp	MC Trials	Test Result			PMSD			
Untransformed		0	C > T	Not Run		Sample passes mean af biomass-mg endpoint 21.0%				
Equal Variance t Two-Sample Test										
Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision( $\alpha:5\%$ )		
21319Reach 4		21319Reach 1	2.607	1.688	36	0.3145	0.0066	Significant Effect		
Auxiliary Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:5\%$ )				
Extreme Value			1.977	3.014	1.0000	No Outliers Detected				
ANOVA Table										
Source	Sum Squares		Mean Square	DF	F Stat	P-Value	Decision( $\alpha:5\%$ )			
Between	2.085531		2.085531	1	6.795	0.0132	Significant Effect			
Error	11.04854		0.3069039	36						
Total	13.13407		2.392434	37						
Distributional Tests										
Attribute	Test		Test Stat	Critical	P-Value	Decision( $\alpha:1\%$ )				
Variances	Variance Ratio F		1.053	3.408	0.8814	Equal Variances				
Distribution	Shapiro-Wilk W Normality		0.959	0.9202	0.1766	Normal Distribution				
Mean AF Biomass-mg Summary										
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
21319Reach 4	24	1.497	1.288	1.706	0.845	2.577	0.112	0.5488	36.66%	0.0%
21319Reach 1	14	1.011	0.797	1.225	0.038	1.947	0.1505	0.5631	55.69%	32.45%
Mean AF Biomass-mg Detail										
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
21319Reach 4	2.396	1.497	1.364	1.348	1.722	1.358	1.094	0.845	2.261	2.577
	1.164	1.956	1.515	0.857	1.037	0.881	2.113	2.507	1.622	1.03
	1.707	1.031	1.042	1						
21319Reach 1	1.747	0.849	1.229	0.998	0.038	1.071	0.954	1.947	1.307	0.511
	1.674	0.843	0.904	0.084						

**STUDY: 21321**  
**CLIENT: Geosyntec Consultants**  
**PROJECT: FC 1640 LVR Toxicity Test**  
**ASSAY: Chironomus dilutus Sediment Assay**  
**TASK: Overlying Water Alkalinity Summary**  
**METHOD: EPA 310.2**

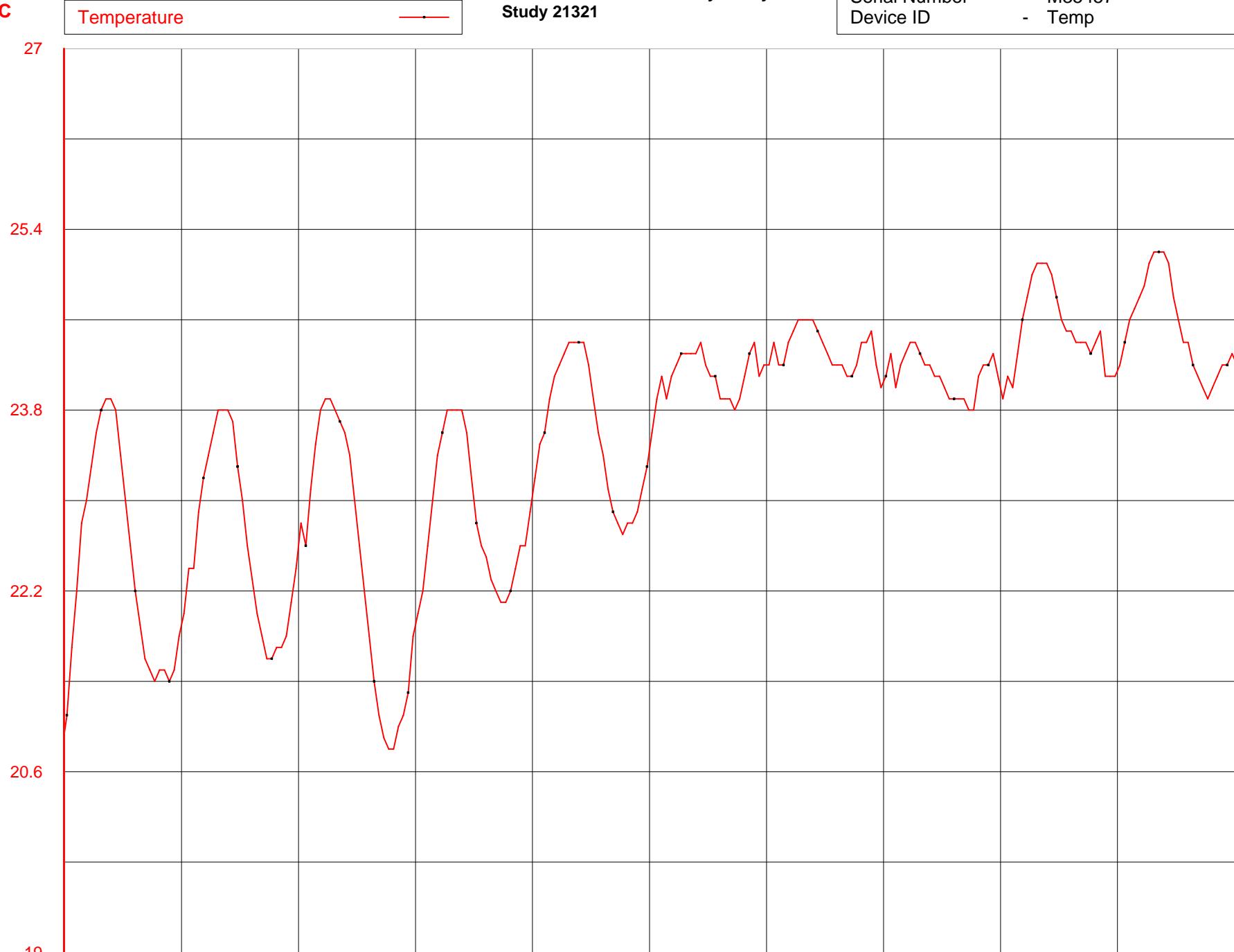
Field ID	Sample Number	Day	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
Laboratory Control	000	0	21321-100	Water	55	2	mg/L	09/16/11 1030	09/16/11 1640
OUI-SE-LVR609-110822	001	0	21321-101	Water	71	2	mg/L	09/16/11 1030	09/16/11 1642
OUI-SE-LVR607-110822	002	0	21321-102	Water	51	2	mg/L	09/16/11 1030	09/16/11 1643
OUI-SE-LVR608-110823	003	0	21321-103	Water	48	2	mg/L	09/16/11 1030	09/16/11 1644
OUI-SE-LVR604-110824	004	0	21321-104	Water	47	2	mg/L	09/16/11 1030	09/16/11 1646
OUI-SE-LVR605-110824	005	0	21321-105	Water	48	2	mg/L	09/16/11 1030	09/16/11 1647
OUI-SE-LVR606-110824	006	0	21321-106	Water	47	2	mg/L	09/16/11 1030	09/16/11 1648
OUI-SE-LVR610-110823	007	0	21321-107	Water	47	2	mg/L	09/16/11 1030	09/16/11 1358
OUI-SE-LVR611-110823	008	0	21321-108	Water	63	2	mg/L	09/16/11 1030	09/16/11 1359
OUI-SE-LVR612-110823	009	0	21321-109	Water	47	2	mg/L	09/16/11 1030	09/16/11 1400
OUI-SE-LVR602-110825	010	0	21321-110	Water	48	2	mg/L	09/16/11 1030	09/16/11 1402
OUI-SE-LVR603-110825	011	0	21321-111	Water	46	2	mg/L	09/16/11 1030	09/16/11 1403
Laboratory Control	000	10	21321-200	Water	51	2	mg/L	09/26/11 1130	09/26/11 1602
OUI-SE-LVR609-110822	001	10	21321-201	Water	80	2	mg/L	09/26/11 1130	09/26/11 1608
OUI-SE-LVR607-110822	002	10	21321-202	Water	69	2	mg/L	09/26/11 1130	09/26/11 1610
OUI-SE-LVR608-110823	003	10	21321-203	Water	57	2	mg/L	09/26/11 1130	09/26/11 1611
OUI-SE-LVR604-110824	004	10	21321-204	Water	60	2	mg/L	09/26/11 1130	09/26/11 1612
OUI-SE-LVR605-110824	005	10	21321-205	Water	59	2	mg/L	09/26/11 1130	09/26/11 1614
OUI-SE-LVR606-110824	006	10	21321-206	Water	59	2	mg/L	09/26/11 1130	09/26/11 1615
OUI-SE-LVR610-110823	007	10	21321-207	Water	61	2	mg/L	09/26/11 1130	09/26/11 1616
OUI-SE-LVR611-110823	008	10	21321-208	Water	76	2	mg/L	09/26/11 1130	09/26/11 1618
OUI-SE-LVR612-110823	009	10	21321-209	Water	61	2	mg/L	09/26/11 1130	09/26/11 1619
OUI-SE-LVR602-110825	010	10	21321-210	Water	59	2	mg/L	09/26/11 1130	09/26/11 1620
OUI-SE-LVR603-110825	011	10	21321-211	Water	58	2	mg/L	09/26/11 1130	09/26/11 1625

**STUDY: 21321**  
**CLIENT: Geosyntec Consultants**  
**PROJECT: FC 1640 LVR Toxicity Test**  
**ASSAY: Chironomus dilutus Sediment Assay**  
**TASK: Overlying Water Hardness Summary**  
**METHOD: SW846 3rd Ed. 6020**

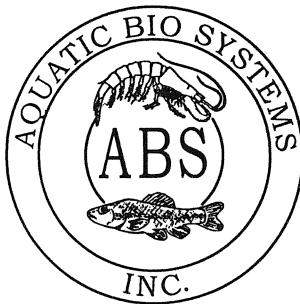
Field ID	Sample Number	Day	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
Laboratory Control	000	0	21321-112	Water	57	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR609-110822	001	0	21321-113	Water	73	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR607-110822	002	0	21321-114	Water	55	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR608-110823	003	0	21321-115	Water	49	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR604-110824	004	0	21321-116	Water	54	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR605-110824	005	0	21321-117	Water	58	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR606-110824	006	0	21321-118	Water	57	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR610-110823	007	0	21321-119	Water	53	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR611-110823	008	0	21321-120	Water	62	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR612-110823	009	0	21321-121	Water	55	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR602-110825	010	0	21321-122	Water	52	0.4	mg/L	09/16/11 1030	09/17/11
OUI-SE-LVR603-110825	011	0	21321-123	Water	51	0.4	mg/L	09/16/11 1030	09/17/11
Laboratory Control	000	10	21321-212	Water	53	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR609-110822	001	10	21321-213	Water	76	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR607-110822	002	10	21321-214	Water	68	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR608-110823	003	10	21321-215	Water	62	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR604-110824	004	10	21321-216	Water	64	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR605-110824	005	10	21321-217	Water	62	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR606-110824	006	10	21321-218	Water	62	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR610-110823	007	10	21321-219	Water	60	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR611-110823	008	10	21321-220	Water	69	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR612-110823	009	10	21321-221	Water	62	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR602-110825	010	10	21321-222	Water	56	0.4	mg/L	09/26/11 1130	09/28/11
OUI-SE-LVR603-110825	011	10	21321-223	Water	59	0.4	mg/L	09/26/11 1130	09/28/11

**STUDY: 21321**  
**CLIENT: Geosyntec Consultants**  
**PROJECT: FC 1640 LVR Toxicity Test**  
**ASSAY: Chironomus dilutus Sediment Assay**  
**TASK: Overlying Water Ammonia Summary**  
**METHOD: SM 4500-NH3 G**

Field ID	Sample Number	Day	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
Laboratory Control	000	0	21321-124	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1214
OUI-SE-LVR609-110822	001	0	21321-125	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1216
OUI-SE-LVR607-110822	002	0	21321-126	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1217
OUI-SE-LVR608-110823	003	0	21321-127	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1221
OUI-SE-LVR604-110824	004	0	21321-128	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1222
OUI-SE-LVR605-110824	005	0	21321-129	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1222
OUI-SE-LVR606-110824	006	0	21321-130	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1223
OUI-SE-LVR610-110823	007	0	21321-131	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1224
OUI-SE-LVR611-110823	008	0	21321-132	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1225
OUI-SE-LVR612-110823	009	0	21321-133	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1226
OUI-SE-LVR602-110825	010	0	21321-134	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1227
OUI-SE-LVR603-110825	011	0	21321-135	Water	ND	0.1	mg/L as N	09/16/11 1030	09/19/11 1227
Laboratory Control	000	10	21321-224	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1402
OUI-SE-LVR609-110822	001	10	21321-225	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1405
OUI-SE-LVR607-110822	002	10	21321-226	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1406
OUI-SE-LVR608-110823	003	10	21321-227	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1409
OUI-SE-LVR604-110824	004	10	21321-228	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1410
OUI-SE-LVR605-110824	005	10	21321-229	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1411
OUI-SE-LVR606-110824	006	10	21321-230	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1412
OUI-SE-LVR610-110823	007	10	21321-231	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1413
OUI-SE-LVR611-110823	008	10	21321-232	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1413
OUI-SE-LVR612-110823	009	10	21321-233	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1414
OUI-SE-LVR602-110825	010	10	21321-234	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1415
OUI-SE-LVR603-110825	011	10	21321-235	Water	ND	0.1	mg/L as N	09/26/11 1130	09/28/11 1416



1300 Blue Spruce Drive, Suite C  
Fort Collins, Colorado 80524



Rec 09/16/11

Toll Free: 800/331-5916  
Tel: 970/484-5091 Fax: 970/484-2514

## ORGANISM HISTORY

DATE: 9/15/2011

SPECIES: *Chironomus dilutus* (formerly *C. tentans*)

AGE: Deposited 9/4/2011

LIFE STAGE: Second Instar 9/15/2011

HATCH DATE: Emergent date 9/28/2011

BEGAN FEEDING: Immediately

FOOD: *Selenastrum* sp., Flake slurry

### Water Chemistry Record:

#### Current

#### Range

TEMPERATURE: 24°C 22-26°C

SALINITY/CONDUCTIVITY: -- --

TOTAL HARDNESS (as CaCO<sub>3</sub>): 104 mg/l 98-190 mg/l

TOTAL ALKALINITY (as CaCO<sub>3</sub>): 75 mg/l 50-110 mg/l

pH: 7.50 7.50-8.20

### Comments:

  
*Steve Johnson*  
*Facility Supervisor*

**Pre-Assay Monitoring  
*Chironomus dilutus*  
 10 Day Sediment Evaluation**

Study: 21321		Client: Geosyntec Consultants		Project: FC 1640 LVR Toxicity Test			
Day	Date	Renewed		Renewed		Overlying Water Ammonia Checked	
		am	Initial	pm	Initial		
0	08/31/11	-	-	-	-	-	
1	09/01/11	-	-	✓	AM	-	
2	09/02/11	✓	AM	✓	AM	✓	
3	09/03/11	✓	CS	✓	AM	-	
4	09/04/11	✓	DM	✓	DM	-	
5	09/05/11	✓	AM	✓	AM	-	
6	09/06/11	✓	AM	✓	AM	✓	
7	09/07/11	✓	AM	✓	AM	-	
8	09/08/11	✓	AM	✓	AM	-	
9	09/09/11	✓		✓	RAM	-	
10	09/10/11	✓	JTP	✓	CO	-	
11	09/11/11	✓	JTP	✓	DM	-	
12	9-12-11	✓	DM	✓	AM	-	
13	9/13/11	✓	AM				
14	9/14/11	✓	JTP	✓	JTP	-	
15	9-15-11	✓	DM	✓	JTP		
Two Volume Additions Twice a Day				Temperature: 23°C			

# Pre-Assay Monitoring Data

**STUDY:** 21321  
**CLIENT:** Geosyntec Consultants  
**PROJECT:** FC 1640 LVR Toxicity Test  
**ASSAY:** Chironomus dilutus Sediment Assay  
**TASK:** Overlying Water Ammonia Summary  
**METHOD:** SM 4500-NH3 G

Field ID	Sample Number	Date	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
Laboratory Control	000	09/02/11	21319-062	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1614
OUI-SE-LVR609-110822	001	09/02/11	21319-063	Water	0.41	0.1	mg/L as N	09/02/11 1500	09/07/11 1615
OUI-SE-LVR607-110822	002	09/02/11	21319-064	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1616
OUI-SE-LVR608-110823	003	09/02/11	21319-065	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1500
OUI-SE-LVR604-110824	004	09/02/11	21319-066	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1502
OUI-SE-LVR605-110824	005	09/02/11	21319-067	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1506
OUI-SE-LVR606-110824	006	09/02/11	21319-068	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1507
OUI-SE-LVR610-110823	007	09/02/11	21319-069	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1508
OUI-SE-LVR611-110823	008	09/02/11	21319-070	Water	0.25	0.1	mg/L as N	09/02/11 1500	09/07/11 1508
OUI-SE-LVR612-110823	009	09/02/11	21319-071	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1509
OUI-SE-LVR602-110825	010	09/02/11	21319-072	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1510
OUI-SE-LVR603-110825	011	09/02/11	21319-073	Water	ND	0.1	mg/L as N	09/02/11 1500	09/07/11 1511
<hr/>									
Laboratory Control	000	09/06/11	21319-136	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1541
OUI-SE-LVR609-110822	001	09/06/11	21319-137	Water	0.18	0.1	mg/L as N	09/06/11 1100	09/07/11 1542
OUI-SE-LVR607-110822	002	09/06/11	21319-138	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1543
OUI-SE-LVR608-110823	003	09/06/11	21319-139	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1544
OUI-SE-LVR604-110824	004	09/06/11	21319-140	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1545
OUI-SE-LVR605-110824	005	09/06/11	21319-141	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1545
OUI-SE-LVR606-110824	006	09/06/11	21319-142	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1546
OUI-SE-LVR610-110823	007	09/06/11	21319-143	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1550
OUI-SE-LVR611-110823	008	09/06/11	21319-144	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1553
OUI-SE-LVR612-110823	009	09/06/11	21319-145	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1556
OUI-SE-LVR602-110825	010	09/06/11	21319-146	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1556
OUI-SE-LVR603-110825	011	09/06/11	21319-147	Water	ND	0.1	mg/L as N	09/06/11 1100	09/07/11 1557

## SAMPLE RECEIPT AND CONDITION DOCUMENTATION

Page 1 of 1

STUDY NO: 21319  
SDG No:  
Project: M and H 2011  
Delivered via: FedEx  
Date and Time Received: 08/24/11 0950 Date and Time Logged into Lab: 08/25/11 1700  
Recieved By: KC/AM Logged into Lab by: AM  
Air bill / Way bill: Yes Air bill included in folder if received? NA  
Cooler on ice/packs: Yes Custody Seals present? NA  
Cooler Blank Temp (C) at arrival: 2 C Custody Seals intact? NA  
Number of COC Pages: 8  
COC Serial Number(s):  
COC Complete:  
    Sampled Date: Yes Does the info on the COC match the samples? Yes  
    Field ID complete: Yes Were samples received within holding time? Yes  
    Sampled Time: Yes Were all samples properly labeled? Yes  
    Analysis request: Yes Were proper sample containers used? Yes  
COC Signed and dated: Yes Were samples received intact? (none broken or leaking) Yes  
Were all samples received? Yes Were sample volumes sufficient for requested analysis? Yes  
Were VOC vials free of headspace? NA  
Client notification/authorization: Not required

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd	Verified
				Pres'n	Pres'n	
OUI-SE-LVR609-110822	21319-001	S	Ha28D, Cd10D	3x1Gal P	4 C	Yes
OUI-SE-LVR607-110822	21319-002	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR608-110823	21319-003	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR604-110824	21319-004	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR605-110824	21319-005	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR606-110824	21319-006	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR610-110823	21319-007	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR611-110823	21319-008	S	Ha28D, Cd10D	3x1Gal P	4 C	Yes
OUI-SE-LVR612-110823	21319-009	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes

Notes and qualifications:

## SAMPLE RECEIPT AND CONDITION DOCUMENTATION

Page 1 of 1

STUDY NO: 21319  
 SDG No:  
 Project: M and H 2011  
 Delivered via: FedEx  
 Date and Time Received: 08/26/11 0930 Date and TIme Logged into Lab: 08/26/11 1230  
 Recieved By: AM Logged into Lab by: AM  
 Air bill / Way bill: No Air bill included in folder if received? NA  
 Cooler on ice/packs: Yes Custody Seals present? NA  
 Cooler Blank Temp (C) at arrival: 3 C Custody Seals intact? NA  
 Number of COC Pages: 2  
 COC Serial Number(s):  
 COC Complete:  
     Sampled Date: Yes Does the info on the COC match the samples? Yes  
     Field ID complete: Yes Were samples received within holding time? Yes  
     Sampled Time: Yes Were all samples properly labeled? Yes  
     Analysis request: Yes Were proper sample containers used? Yes  
 COC Signed and dated: Yes Were samples received intact? (none broken or leaking) Yes  
 Were all samples received? Yes Were sample volumes sufficient for requested analysis? Yes  
 Client notification/authorization: Not required Were VOC vials free of headspace? NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd	Verified
				Pres'n	Pres'n	
OUI-SE-LVR602-110825	21319-010	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes
OUI-SE-LVR603-110825	21319-011	S	Ha28D, Cd10D	2x1Gal P	4 C	Yes

Notes and qualifications:

--

**ESI**

EnviroSystems, Inc.  
1 Lafayette Road  
P.O. Box 778  
Hampton, N.H. 03843

Voice: 603-926-3345  
FAX: 603-926-3521

ESI Job No: 21319

**CHAIN OF CUSTODY DOCUMENTATION**

Client:	Geosyntec Consultants	Contact:	Meghan Schuck	Project Name:	MFH 2011	Page	1	of	1
Report to:	Meghan Schuck	Address:	134 N. LaSalle St. 300	Project Number:	FC 1640				
Telephone to:	Meghan Schuck	Address:	Chicago, IL 60603	Project Manager:	Keith Tolson				
Voice:	312-416-3905	Fax:	312-658-0576	email:	Mschuck@geosyntec.com	PO. No.:		Quote No.:	
Protocol:	RCRA	SDWA	NPDES	USCOE	Other				
Lab Number (assigned by ESI)	Your Field ID: (must agree with container)		Date Sampled	Time Sampled	Grab or com- posit (G/C)	Container Size <small>(ml)</small>	Container Type (P/G/T)	Field Preser- vation	Matrix
-001	OVI-SE-LVR009-110822	8/22/11	17:15	MS	C	1	P	ice	S
-001	OVI-SE-LVR009-110822	8/22/11	17:15	MS	C	1	P	ice	S
-001	OVI-SE-LVR009-110822	8/22/11	17:15	MS	C	1	P	ice	S
Comments:	Data Appendix Page 21319Cd-R2.								
Re-Quenched By:	Meghan Schuck	Re-Quench Date:	8/23/11	Time:	10:55	Received By:	FED EX	Date:	Time:
Re-Quenched By:	FED EX	Date:	08/24/11	Time:	0950	Received at Lab By:	J. Tolson	Date:	Time:
Comments:	Comments: Coolers #1, 60° open receipt.								

## CHAIN OF CUSTODY DOCUMENTATION

osynec consultant

meanan Schuck

Toxicity Test: ~~negative~~ **positive** Date: 3/24/16-2905  
by: Meghan Schuck

Geosyntec Consultants. ESI Study 21319Cd-R2

Received By: <u>Morgan Schult</u>	Date: <u>8/23/11</u>	Time: <u>10:15</u>	Received By: <u>FED EX</u>	Date: <u>8/24/11</u>	Time: <u>0950</u>
Received By: <u>FED EX</u>	Date: <u>8/24/11</u>	Time: <u>0950</u>	Received at Lab By: <u>J. K. Gull</u>	Date: <u>8/24/11</u>	Time: <u>0950</u>

Sample Delivery Group No:	Page	of
---------------------------	------	----

EnviroSystems, Inc.  
1 Lafayette Road  
P.O. Box 778  
Hampton, N.H. 03843

Voice: 603-926-3345  
FAX: 603-926-3521

ESI Job No: Z1319

## CHAIN OF CUSTODY DOCUMENTATION

Received By: <u>Megan Smith</u>	Date: <u>8/23/11</u>	Time: <u>10:15</u>	Received By: <u>FedEx</u>	Date: <u>8/24/11</u>	Time: <u>10:15</u>
Released By: <u>FED EX</u>	Date: <u>8/24/11</u>	Time: <u>0458</u>	Received at Lab By: <u>J. H. Gamm</u>	Date: <u>8/24/11</u>	Time: <u>0750</u>
Comments: <u>100% - #3 - 50%</u>					

Comments: \_\_\_\_\_  
Sample Delivery Group No: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_  
200 Doc No: 1501

**CHAIN OF CUSTODY RECORD**

## **ENVIRONMENTAL SYSTEMS INCORPORATED**

P.O. Box 778, Hampton, New Hampshire 03842



**EnviroSystems, Inc.**  
1 Lafayette Road  
P.O. Box 778  
Hampton, N.H. 03843

Voice: 603-926-3345  
FAX: 603-926-3521

ESI Job No:

21319

## CHAIN OF CUSTODY DOCUMENTATION

Hampton, N.H. 03843

FC

Voice: 603-926-3345  
FAX: 603-926-3521

ESI Job No:

21319

COC Doc No: 4347

Sample Delivery Group No:

Page \_\_\_\_\_ of \_\_\_\_\_

**ENVIROSYSTEMS, INCORPORATED**  
P.O. Box 778, Hampton, New Hampshire 03842

**CHAIN OF CUSTODY RECORD**

**ENVIROSYSTEMS, INCORPORATED**  
P.O. Box 778, Hampton, New Hampshire 03842



**CHAIN OF CUSTODY RECORD**

## **ENVIBIOSYSTEMS INCORPORATED**

P.O. Box 778 Hampton New Hampshire 03842

ESI Study Number: 21319

ESI Study Number:

**CHAIN OF CUSTODY RECORD**

ENVIROSYSTEMS, INCORPORATED

P.O. Box 778, Hampton, New Hampshire 03842

**FedEx**® NEW Package  
Express US Airbill

FedEx  
Tracking  
Number

8762 6073 6453

0200 FedEx ID No.

FedEx Retrieval Co.

1 From **8/23/11** Sender's FedEx Account Number **4003-70008**

Sender's Name **G Meghan Schuck** Phone **813 335-5436**

Company **Geosyntec Consultants**

Address **134 N. LaSalle St, Suite 300** Dept/Floor/Suite/Room

City **Chicago** State **IL** ZIP **60602**

2 Your Internal Billing Reference **B/FC1640-15 Schuck**

3 To Recipient's Name **Lab RECEIVING** Phone **603 926-3345**

Company **EnviroSystems, Inc.**

Address **1 Lafayette Rd** Dept/Floor/Suite/Room **01**

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address **Hampshire** State **NH** ZIP **03843**

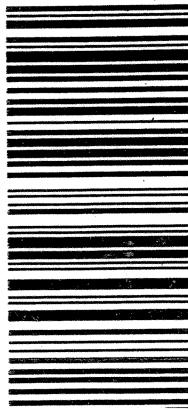


8762 6073 6453

WED - 24 AUG A4  
PRIORITY OVERNIGHT  
**03843**  
NH-US MHT

j453

2A



4 Express Package Service \* To most locations.  
NOTE: Service order has changed. Please select carefully.

**Next Business Day**

FedEx First Overnight  
Earliest next business morning delivery to selected locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx Priority Overnight  
Next business morning.\* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx Standard Overnight  
Next business afternoon.\* Saturday Delivery NOT available.

**5 Packaging** \* Declared value limit \$500.

FedEx Envelope\*  FedEx Pak\*  FedEx Box  FedEx Tube  **01** **01**

**6 Special Handling and Delivery Signature Options**

**03** **SATURDAY DELIVERY**

No Signature Required  
Package may be left without obtaining a signature for delivery.

Direct Signature  
Someone at recipient's address may sign for delivery. *Fee applied*

Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. *Fee applied*

Does this shipment contain dangerous goods?

One box must be checked.

**No**  Yes As per attached Shipper's Declaration

**Yes** Shipper's Declaration **06** Dry Ice

Dry Ice, 9, UN 1945 kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

Cargo Aircraft Only

**7 Payment Bill to:**

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No.

1  Sender Acct. No. in Section 2  Recipient 3  Third Party 4  Credit Card 5  Cash/Ch

**01** **02** **03** **04** **05** **06** **07** **08** **09** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **30** **31** **32** **33** **34** **35** **36** **37** **38** **39** **40** **41** **42** **43** **44** **45** **46** **47** **48** **49** **50** **51** **52** **53** **54** **55** **56** **57** **58** **59** **60** **61** **62** **63** **64** **65** **66** **67** **68** **69** **70** **71** **72** **73** **74** **75** **76** **77** **78** **79** **80** **81** **82** **83** **84** **85** **86** **87** **88** **89** **90** **91** **92** **93** **94** **95** **96** **97** **98** **99** **00**

Total Packages **3** Total Weight lbs.

Credit Card Auth.

\*Our liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.

Rev. Date 11/10 • Part #163136 • ©1994-2010 FedEx • PRINTED IN U.S.A. SRV

612





FedEx Co|

**1 From** 310311 Sender's FedEx Tracking number  
Date 8762 6073 6453 0200 Form No.  
Sender's Name **2 Your Internal Billing Reference** B/FCL4015

Packages up to 1501

For packages over 1501, use the

FedEx Express Freight rate.

See back of form for details.

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FDIC Member FDIC Insured

FDIC Insurance Fund

**4 Express Package Service**

NOTE: Sender enter has changed. Please select carefully.

- FedEx First Overnight** Earliest next business morning delivery to select locations. Same day delivery to most major cities in the United States. Money orders SATURDAY Delivery NOT available.
- NEW FedEx 2Day A.M.** Second business morning delivery to select locations. Money orders SATURDAY Delivery NOT available.
- FedEx 2Day** Second business afternoon.\* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- FedEx Priority Overnight** Next business morning, Friday shipments will be delivered on Monday or Saturday unless SATURDAY Delivery is available.
- FedEx Standard Overnight** Next business afternoon.\* Saturday delivery NOT available.
- FedEx Pak\***
- Dept/Room/SuiteRoom**

**5 Packaging**

\*Deluxe value limit \$50.

**6 Special Handling and Delivery Signature Options****7 Payment Bill to:****8 Payment Bill to:****9 Payment Bill to:****10 Payment Bill to:****11 Payment Bill to:****12 Payment Bill to:****13 Payment Bill to:****14 Payment Bill to:****15 Payment Bill to:****16 Payment Bill to:****17 Payment Bill to:****18 Payment Bill to:****19 Payment Bill to:****20 Payment Bill to:****21 Payment Bill to:****22 Payment Bill to:****23 Payment Bill to:****24 Payment Bill to:****25 Payment Bill to:****26 Payment Bill to:****27 Payment Bill to:****28 Payment Bill to:****29 Payment Bill to:****30 Payment Bill to:****31 Payment Bill to:****32 Payment Bill to:****33 Payment Bill to:****34 Payment Bill to:****35 Payment Bill to:****36 Payment Bill to:****37 Payment Bill to:****38 Payment Bill to:****39 Payment Bill to:****40 Payment Bill to:****41 Payment Bill to:****42 Payment Bill to:****43 Payment Bill to:****44 Payment Bill to:****45 Payment Bill to:****46 Payment Bill to:****47 Payment Bill to:****48 Payment Bill to:****49 Payment Bill to:****50 Payment Bill to:****51 Payment Bill to:****52 Payment Bill to:****53 Payment Bill to:****54 Payment Bill to:****55 Payment Bill to:****56 Payment Bill to:****57 Payment Bill to:****58 Payment Bill to:****59 Payment Bill to:****60 Payment Bill to:****61 Payment Bill to:****62 Payment Bill to:****63 Payment Bill to:****64 Payment Bill to:****65 Payment Bill to:****66 Payment Bill to:****67 Payment Bill to:****68 Payment Bill to:****69 Payment Bill to:****70 Payment Bill to:****71 Payment Bill to:****72 Payment Bill to:****73 Payment Bill to:****74 Payment Bill to:****75 Payment Bill to:****76 Payment Bill to:****77 Payment Bill to:****78 Payment Bill to:****79 Payment Bill to:****80 Payment Bill to:****81 Payment Bill to:****82 Payment Bill to:****83 Payment Bill to:****84 Payment Bill to:****85 Payment Bill to:****86 Payment Bill to:****87 Payment Bill to:****88 Payment Bill to:****89 Payment Bill to:****90 Payment Bill to:****91 Payment Bill to:****92 Payment Bill to:****93 Payment Bill to:****94 Payment Bill to:****95 Payment Bill to:****96 Payment Bill to:****97 Payment Bill to:****98 Payment Bill to:****99 Payment Bill to:****100 Payment Bill to:****101 Payment Bill to:****102 Payment Bill to:****103 Payment Bill to:****104 Payment Bill to:****105 Payment Bill to:****106 Payment Bill to:****107 Payment Bill to:****108 Payment Bill to:****109 Payment Bill to:****110 Payment Bill to:****111 Payment Bill to:****112 Payment Bill to:****113 Payment Bill to:****114 Payment Bill to:****115 Payment Bill to:****116 Payment Bill to:****117 Payment Bill to:****118 Payment Bill to:****119 Payment Bill to:****120 Payment Bill to:****121 Payment Bill to:****122 Payment Bill to:****123 Payment Bill to:****124 Payment Bill to:****125 Payment Bill to:****126 Payment Bill to:****127 Payment Bill to:****128 Payment Bill to:****129 Payment Bill to:****130 Payment Bill to:****131 Payment Bill to:****132 Payment Bill to:****133 Payment Bill to:****134 Payment Bill to:****135 Payment Bill to:****136 Payment Bill to:****137 Payment Bill to:****138 Payment Bill to:****139 Payment Bill to:****140 Payment Bill to:****141 Payment Bill to:****142 Payment Bill to:****143 Payment Bill to:****144 Payment Bill to:****145 Payment Bill to:****146 Payment Bill to:****147 Payment Bill to:****148 Payment Bill to:****149 Payment Bill to:****150 Payment Bill to:****151 Payment Bill to:****152 Payment Bill to:****153 Payment Bill to:****154 Payment Bill to:****155 Payment Bill to:****156 Payment Bill to:****157 Payment Bill to:****158 Payment Bill to:****159 Payment Bill to:****160 Payment Bill to:****161 Payment Bill to:****162 Payment Bill to:****163 Payment Bill to:****164 Payment Bill to:****165 Payment Bill to:****166 Payment Bill to:****167 Payment Bill to:****168 Payment Bill to:****169 Payment Bill to:****170 Payment Bill to:****171 Payment Bill to:****172 Payment Bill to:****173 Payment Bill to:****174 Payment Bill to:****175 Payment Bill to:****176 Payment Bill to:****177 Payment Bill to:****178 Payment Bill to:****179 Payment Bill to:****180 Payment Bill to:****181 Payment Bill to:****182 Payment Bill to:****183 Payment Bill to:****184 Payment Bill to:****185 Payment Bill to:****186 Payment Bill to:****187 Payment Bill to:****1**

Cooler #1

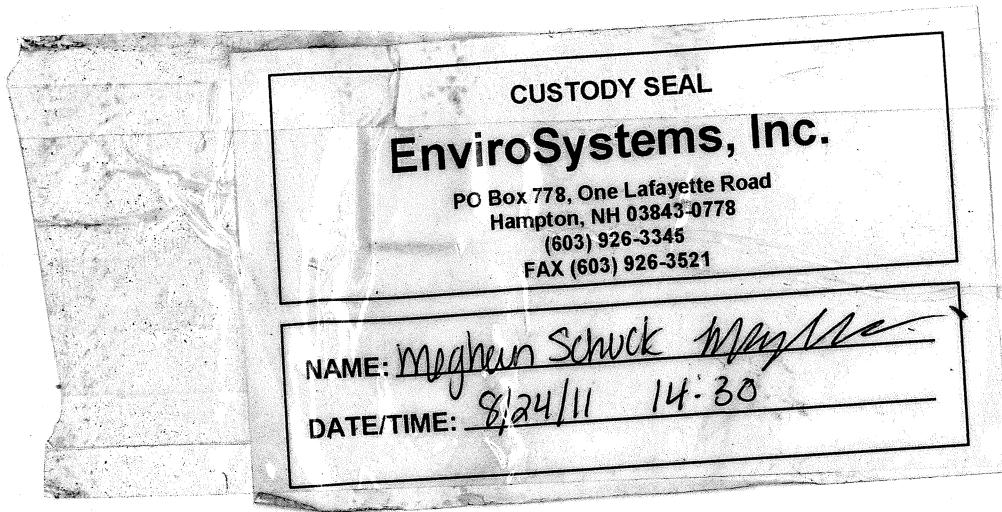
CUSTODY SEAL	
<b>EnviroSystems, Inc.</b>	
PO Box 778, One Lafayette Road Hampton, NH 03843-0778 (603) 926-3345 FAX (603) 926-3521	
NAME: <u>Megan Schulte Meyer</u>	DATE/TIME: <u>8/23/11 10:15</u>

Cooler #3

CUSTODY SEAL	
<b>EnviroSystems, Inc.</b>	
PO Box 778, One Lafayette Road Hampton, NH 03843-0778 (603) 926-3345 FAX (603) 926-3521	
NAME: <u>Megan Schulte Meyer</u>	DATE/TIME: <u>8/23/11 10:15</u>

Cooler #2

CUSTODY SEAL	
<b>EnviroSystems, Inc.</b>	
PO Box 778, One Lafayette Road Hampton, NH 03843-0778 (603) 926-3345 FAX (603) 926-3521	
NAME: <u>Megan Schulte Meyer</u>	DATE/TIME: <u>8/23/11 10:15</u>



**dEX® NEW Package US Airbill**

From Date 08/24/2011 Sender's FedEx Account Number 4203-7000-8

Sender's Name Meghan Schuck Phone 813 335-5236

Company Geosynthetic Consultants Address 134 N. Lasalle Street Suite 300

City Chicago State IL ZIP 60602

Your Internal Billing Reference B/FC 1640-15 Schuck

To Recipient's Name Lab Receiving Phone 603 926-3345

Company EnviroSystems, Inc. *[Signature]*

Address 1 One Lafayette Road

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address Use this line for the HOLD location address or for continuation of your shipping address.

City Hampton State NH ZIP 03843

**0200 Form ID No.**

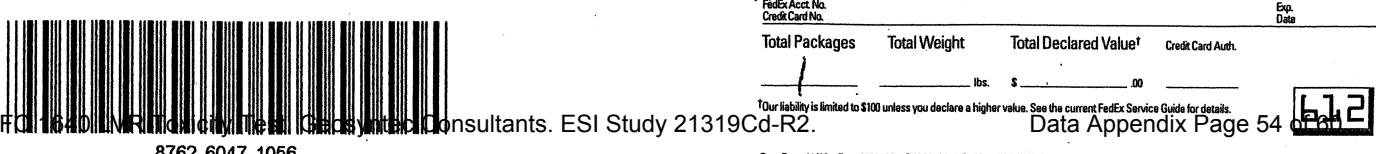
**FedEx Copy**

**4 Express Package Service** \*To most locations.  
NOTE: Service order has changed. Please select carefully.

**Packages up to 150 lbs.**  
For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

<b>06</b> <input type="checkbox"/> FedEx First Overnight	Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	<b>20</b> <input type="checkbox"/> FedEx 2Day A.M.	Second business morning.* Saturday Delivery NOT available.
<b>01</b> <input checked="" type="checkbox"/> FedEx Priority Overnight	Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.	<b>03</b> <input type="checkbox"/> FedEx 2Day	Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
<b>05</b> <input type="checkbox"/> FedEx Standard Overnight	Next business afternoon.* Saturday Delivery NOT available.	<b>20</b> <input type="checkbox"/> FedEx Express Saver	Third business day.* Saturday Delivery NOT available.
<b>5 Packaging</b> *Declared value limit \$500.		<b>6 Special Handling and Delivery Signature Options</b>	
<b>06</b> <input type="checkbox"/> FedEx Envelope* <b>02</b> <input type="checkbox"/> FedEx Pak* <b>03</b> <input type="checkbox"/> FedEx Box <b>04</b> <input type="checkbox"/> FedEx Tube <b>01</b> <input checked="" type="checkbox"/> Other		<b>03</b> <input type="checkbox"/> SATURDAY DELIVERY	
<b>No Signature Required</b> <input type="checkbox"/> Package may be left without obtaining a signature for delivery.		<b>10</b> <input type="checkbox"/> Direct Signature Someone at recipient's address may sign for delivery. <b>34</b> <input type="checkbox"/> Indirect Signature If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. <b>Fee applies.</b>	
<b>Does this shipment contain dangerous goods?</b> <input type="checkbox"/> Yes <b>04</b> <input type="checkbox"/> No As per attached Shipper's Declaration. <b>06</b> <input type="checkbox"/> Dry Ice Dry Ice, 9, UN 1845 _____ kg		<b>Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.</b>	
<b>7 Payment Bill to:</b>		Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No. <input type="checkbox"/>	
<b>1</b> <input type="checkbox"/> Sender Acct. No. in Section 1 will be billed. <b>2</b> <input type="checkbox"/> Recipient FedEx Acct. No. Credit Card No. <b>3</b> <input type="checkbox"/> Third Party <b>4</b> <input type="checkbox"/> Credit Card <b>5</b> <input type="checkbox"/> Cash/Check		Exp. Date <input type="checkbox"/>	
Total Packages		Total Weight	Total Declared Value <sup>†</sup>
<b>1</b>		Ibs. \$ . . . . .	Credit Card Auth.

<sup>†</sup>Your liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.



**FedEx** Express NEW Package US Airbill

FedEx Tracking Number

8762 6047 1056

1 From Date 08/24/2011 Sender's FedEx Account Number

Sender's Name Meghan Schuck Phone 813 335-5236

Company Geosyntec Consultants

Address 134 N. LaSalle Street Suite 300

City Chicago State IL ZIP 60602

2 Your Internal Billing Reference B/FC 1640-15 Schuck

3 To Recipient's Name Lab Receiving Phone 603 926-3345

Company EnviroSystems, Inc. Signature *[Signature]*

Address 1 Long Lafayette Road Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address Use this line for the HOLD location address or for continuation of your shipping address.

City Hampton State NH ZIP 03843



**FedEx** Express NEW Package US Airbill

FedEx Tracking Number

8762 6047 1056

4203 - 7000 - 8

1 From Date 08/24/2011 Sender's FedEx Account Number

Sender's Name Meghan Schuck Phone 813 335-5236

Company Geosyntec Consultants

Address 134 N. LaSalle Street Suite 300

City Chicago State IL ZIP 60602

2 Your Internal Billing Reference B/FC 1640-15 Schuck

3 To Recipient's Name Lab Receiving Phone 603 926-3345

Company EnviroSystems, Inc. Signature *[Signature]*

Address 1 Long Lafayette Road Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address Use this line for the HOLD location address or for continuation of your shipping address.

City Hampton State NH ZIP 03843



FC 1640 Lab Toxicity Test. Geosyntec Consultants. ESI Study 21319Cd-R2.  
8762 6047 1056

0200 Form ID No.

FedEx Copy

Packages up to 150 lbs.

For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

4 Express Package Service \* To most locations.

NOTE: Service order has changed. Please select carefully.

Next Business Day

06  FedEx First Overnight  
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01  FedEx Priority Overnight  
Next business morning.\* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05  FedEx Standard Overnight  
Next business afternoon.\* Saturday Delivery NOT available.

5 Packaging \* Declared value limit \$500.

06  FedEx Envelope\* 02  FedEx Pak\* 03  FedEx Box 04  FedEx Tube 01  Other

6 Special Handling and Delivery Signature Options

03  SATURDAY DELIVERY

No Signature Required  
Package may be left without obtaining a signature for delivery.

10  Direct Signature  
Someone at recipient's address may sign for delivery. Fee applies.

Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?

One box must be checked.

No 04  Yes As per attached Shipper's Declaration.  Yes Shipper's Declaration not required.

Dry Ice Dry Ice, 9, UN 1845 kg  
Cargo Aircraft Only

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No.

1  Sender Acct. No. in Section 2  Recipient 3  Third Party 4  Credit Card 5  Cash/Credit Card No.

Total Packages Total Weight Total Declared Value\* Credit Card Auth.

0200 Form ID No.

FedEx Copy

Packages up to 150 lbs.

For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

4 Express Package Service \* To most locations.

NOTE: Service order has changed. Please select carefully.

Next Business Day

06  FedEx First Overnight  
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01  FedEx Priority Overnight  
Next business morning.\* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05  FedEx Standard Overnight  
Next business afternoon.\* Saturday Delivery NOT available.

5 Packaging \* Declared value limit \$500.

06  FedEx Envelope\* 02  FedEx Pak\* 03  FedEx Box 04  FedEx Tube 01  Other

6 Special Handling and Delivery Signature Options

03  SATURDAY DELIVERY

No Signature Required  
Package may be left without obtaining a signature for delivery.

10  Direct Signature  
Someone at recipient's address may sign for delivery. Fee applies.

Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?

One box must be checked.

No 04  Yes As per attached Shipper's Declaration.  Yes Shipper's Declaration not required.

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.  
Dry Ice Dry Ice, 9, UN 1845 kg  
Cargo Aircraft Only

7 Payment Bill to:

Enter FedEx Acct. No. or Credit Card No. below. Obtain recip. Acct. No.

1  Sender Acct. No. in Section 2  Recipient 3  Third Party 4  Credit Card 5  Cash/Credit Card No.

Total Packages Total Weight Total Declared Value\* Credit Card Auth.

1 lbs. \$ 00.00

Our liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.

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**CUSTODY SEAL**  
**EnviroSystems, Inc.**

PO Box 778, One Lafayette Road  
 Hampton, NH 03843-0778  
 (603) 926-3345  
 FAX (603) 926-3521

NAME: Meghan Schuck MM  
 DATE/TIME: 8/25/11 11:00

**FedEx** NEW Package  
 Express US Airbill

FedEx  
 Tracking  
 Number

8762 6047 1089

0200 Form  
 ID No.

FedEx Retrieval Copy

1 From Date 08/25/2011 Sender's FedEx Account Number 4203-7000-8  
 Sender's Name Meghan Schuck Phone 813 335-5236  
 Company Geosyntec Consultants  
 Address 134 N. LaSalle St. Suite 300  
 City Chicago State IL ZIP 60602  
 Dept/Floor/Suite/Room

2 Your Internal Billing Reference B10 FC1640-15 Schuck

3 To Recipient's Name Lab Receiving  
 Company EnviroSystems, Inc.  
 Address 1 Lafayette Road  
 We cannot deliver to P.O. boxes or P.O. ZIP codes.  
 Dept/Floor/Suite/Room

Address Use this line for the HOLD location address or for continuation of your shipping address.  
 City Hampton State NH ZIP 03843

HOLD Weekday  
 FedEx location address  
 REQUIRED. NOT available for  
 FedEx First Overnight.

01

HOLD Saturday  
 FedEx location address  
 REQUIRED. Available ONLY for  
 FedEx Priority Overnight and  
 FedEx 2Day to select locations.

31

4 Express Package Service \* To most locations.  
NOTE: Service order has changed. Please select carefully.

Packages up to 150 lbs.  
For packages over 150 lbs., use the new  
 FedEx Express Freight US Airbill.

Next Business Day

06  FedEx First Overnight  
 Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

01  FedEx Priority Overnight  
 Next business morning.\* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

05  FedEx Standard Overnight  
 Next business afternoon.\*  
 Saturday Delivery NOT available.

2 or 3 Business Days

49  NEW FedEx 2Day A.M.  
 Second business morning.\*  
 Saturday Delivery NOT available.

03  FedEx 2Day  
 Second business afternoon.\* Thursday shipments  
 Will be delivered on Monday unless SATURDAY  
 Delivery is selected.

20  FedEx Express Saver  
 Third business day.\*  
 Saturday Delivery NOT available.

5 Packaging \* Declared value limit \$500:

06  FedEx Envelope\* 02  FedEx Pak\* 03  FedEx Box 04  FedEx Tube 01  Other

6 Special Handling and Delivery Signature Options

03  SATURDAY DELIVERY

No Signature Required  
 Package may be left without  
 obtaining a signature for delivery.

Direct Signature  
 Someone at recipient's address  
 may sign for delivery. Fee applies

Indirect Signature  
 If no one is available at recipient's  
 address, someone at a neighboring  
 address may sign for delivery. For  
 residential deliveries only. Fee applies

Does this shipment contain dangerous goods?

No 04  Yes  
 04  As per attached  
 Shipper's Declaration.  Yes  
 Shipper's Declaration not required.

06  Dry Ice  
 Dry Ice, 9, UN 1845 \_\_\_\_\_ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging  
 or placed in a FedEx Express Drop Box.

Cargo Aircraft Only

7 Payment Bill to:

1  Sender Enter FedEx Acct. No. or Credit Card No. below. Obtain recip.  
 Acct. No. in Section \_\_\_\_\_  
 I will be billed. 2  Recipient 3  Third Party 4  Credit Card 5  Cash/Check

Total Packages

1

Total Weight

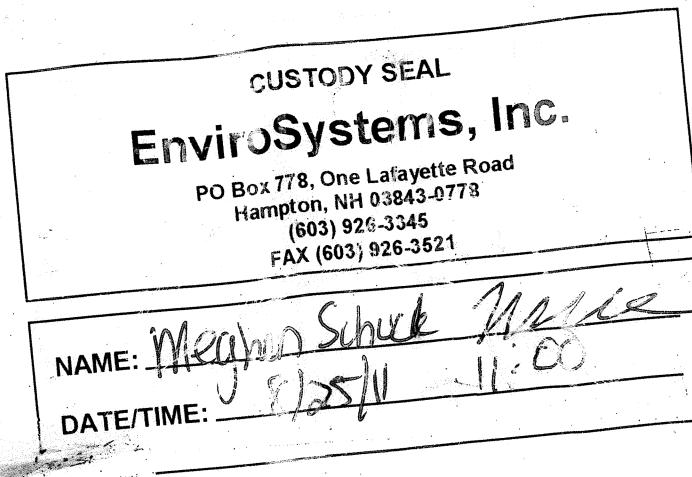
1.00 lbs.

Credit Card Auth.

\*Our liability is limited to \$100 unless you declare a higher value. See the current FedEx Service Guide for details.

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## FedEx® NEW Package US Airbill

FedEx  
Tracking  
Number

8762 6047 1089

0200

Form  
ID #

## FedEx Retrieval Copy

**1 From** *Meagan Schuck* Sender's FedEx Account Number

Date *08/25/11*

Sender's Name *Meagan Schuck* Phone *603 335-5236*

Company *EnviroSystems Consultants*

Address *134 N. Lafayette St. Suite 300* Dept/Floor/Suite/Room

City *Cherry* State *NH* ZIP *03843*

**2 Your Internal Billing Reference** *B10 FC1640-15 Schuck*

**3 To** Recipient's Name *Lab Recovery*

Company *EnviroSystems, Inc.*

Address *1 Lafayette Road* Dept/Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address Use this line for the HOLD location address or for continuation of your shipping address.

City *Hampton* State *NH* ZIP *03843*

HOLD Weekday  
FedEx location address  
REQUIRED. NOT available for  
FedEx First Overnight.

HOLD Saturday  
FedEx location address  
REQUIRED. Available ONLY for  
FedEx Priority Overnight and  
FedEx 2Day to select locations.

### 4 Express Package Service \* To most locations. NOTE: Service order has changed. Please select carefully.

#### Next Business Day

FedEx First Overnight  
Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx Priority Overnight  
Next business morning. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

FedEx Standard Overnight  
Next business afternoon. Saturday Delivery NOT available.

Packages up to 150 lbs.  
For packages over 150 lbs., use the new  
FedEx Express Freight US Airbill.

NEW FedEx 2Day A.M.  
Second business morning.  
Saturday Delivery NOT available.

FedEx 2Day  
Second business afternoon. Thursday shipments  
will be delivered on Monday unless SATURDAY  
Delivery is selected.

FedEx Express Saver  
Third business day.  
Saturday Delivery NOT available.

### 5 Packaging \* Declared value limit \$500.

FedEx Envelope\*  FedEx Pak\*  FedEx Box  FedEx Tube  Other

### 6 Special Handling and Delivery Signature Options

#### 03 SATURDAY DELIVERY

No Signature Required  
Package may be left without obtaining a signature for delivery. *Fees applies.*

Direct Signature  
Someone at recipient's address may sign for delivery. *Fees applies.*

Indirect Signature  
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. *Fees applies.*

#### Does this shipment contain dangerous goods?

Yes  
As per attached Shipper's Declaration.  Yes  
Shipper's Declaration not required.

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.

Cargo Aircraft Only

#### 7 Payment Bill to:

1 Sender Acct. No. in Section 1 will be billed.  2 Recipient  3 Third Party  4 Credit Card  5 Cash/Check

Total Packages

Total Weight

Credit Card Auth.

Our liability is limited to \$100 unless you declare a higher value.

Insured Value

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**ESI**

EnviroSystems, Inc.

**CORRECTIVE ACTION REPORT**Page No: 1Out of Control Event Unusual Occurrence **Description of Event:**

Study Number 21319 - Chironomus dilutus 10-day sediment evaluation data transcription error related to transfer of survival data from recovery sheets to CETIS data form. Survival data were then analyzed to obtain mean, maximum and minimum survival for each treatment. Preliminary survival summary data were then emailed to client for review.

Reported By: Ken Simon Date: 12/20/2011 Time: 11:00**Investigative and Assessment of Event:**

Transcription of survival data from recovery data sheets was made to an Excel spreadsheet that had been setup for the purpose. Data entry cells and identifiers (column names etc) had been copied from CETIS and were set so that the order of the cells was by test chamber number. The numbers of surviving midge larvae were entered into the spreadsheet and I then checked for entry errors myself. None were found. Using standard procedures I then resorted the data by the laboratory code and replicate and copied the cells containing the number of surviving larvae to the CETIS database file and ran the preliminary calculations to compute the mean survival data by sample site. During the data transfer process I failed to recognize that the data order for CETIS database form was **NOT** strictly by laboratory code but rather by laboratory code with the order set so that project reference sites, lab codes -007, -008, and -009, were at the top of the database list, just below the cells for the laboratory control treatment. As a result survival data were entered into the CETIS data base in the following order; -000, -001, -002, -003, -004, -005, -006, -007, -008, -009, -010 and -011, instead of the correct order; -000, -007, -008, -009, -001, -002, -003, -004, -005, -006, -010, -011. The net result was that data for the lab control in the preliminary summary was correct as was the data for samples -010 and -011 while the data for samples -001 through -009 were incorrect. This error was not caught at the time of the data entry and making the preliminary data summary. The error was caught by Ms. McIsaac when she was entering growth data and preparing to finalize data computations. At that time a standard review of the survival data entry showed the error in the data entry. The original survival data were updated with the data entered in the correct order.

By: Ken Simon & Renee McIsaac Date: 12/20/2011**Corrective Action Taken:**

Data validation must be conducted before any data is released to a client, even in cases where the data is classed as preliminary. ESI's reporting and data review requirements specify that all data is to be reviewed prior to release. This review is to include an independent review by a third party. In this case there was a review by the same person who had entered the data and the review failed to note the order of the samples in the CETIS database. All future data entry made by myself will be validated by a third person familiar with the design of the study and associated data entry.

**Follow-up (As Appropriate):**

By: Petio Koebe Date: 12/22/11  
QA Mgr.

**CORRECTIVE ACTION REPORT**Page No: 1Out of Control Event Unusual Occurrence **Description of Event:**

Study Number 21319 - Chironomus dilutus 10-day sediment evaluation Data Appendix Worksheet was not replaced after data update. This record contained results that were not properly paired with the samples.

Reported By: Renee Ashley McIsaac Date: 12/20/2011 Time: 16:00

**Investigative and Assessment of Event:**

During a second review of the report it was determined that the CETIS Worksheet that was included in the Data Appendix was not the updated version. During the initial edit of the data appendix, the PDF output file for the replacement worksheet data page looked identical to and had same name as the original file. This lead to the incorrect page being selected in the edit. Essentially, the original, incorrect page was replaced with the same page. This should have been noticed prior to issue of the revised report.

By: Ken Simon & Renee McIsaac Date: 12/20/2011

**Corrective Action Taken:**

Data validation must be conducted before any data is released to a client. ESI's reporting and data review requirements specify that all data is to be reviewed prior to release. This review is to include an independent review by a third party. Additionally, updated output files will receive new names that include either a descriptor indicating they are "Updated File" or other appropriate wording. Old output files that contain inappropriate material will either be deleted or moved to an appropriate subdirectory clearly identified as containing outdated material.

**Follow-up (As Appropriate):**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
By: Peter Korbel Date: 12/21/2011  
QA Mgr.